FREE! OCTANE VIDEO GUIDE TURN TO PAGE 10

Practical inspiration for the 3D community

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MASTER ARCH VIZ

Pro advice on designing and building your best architectural renders

+

REALISTIC OCTANE TERRAINS

DISNEY'S REAL-TIME SHORTS

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Get the most out of the new release

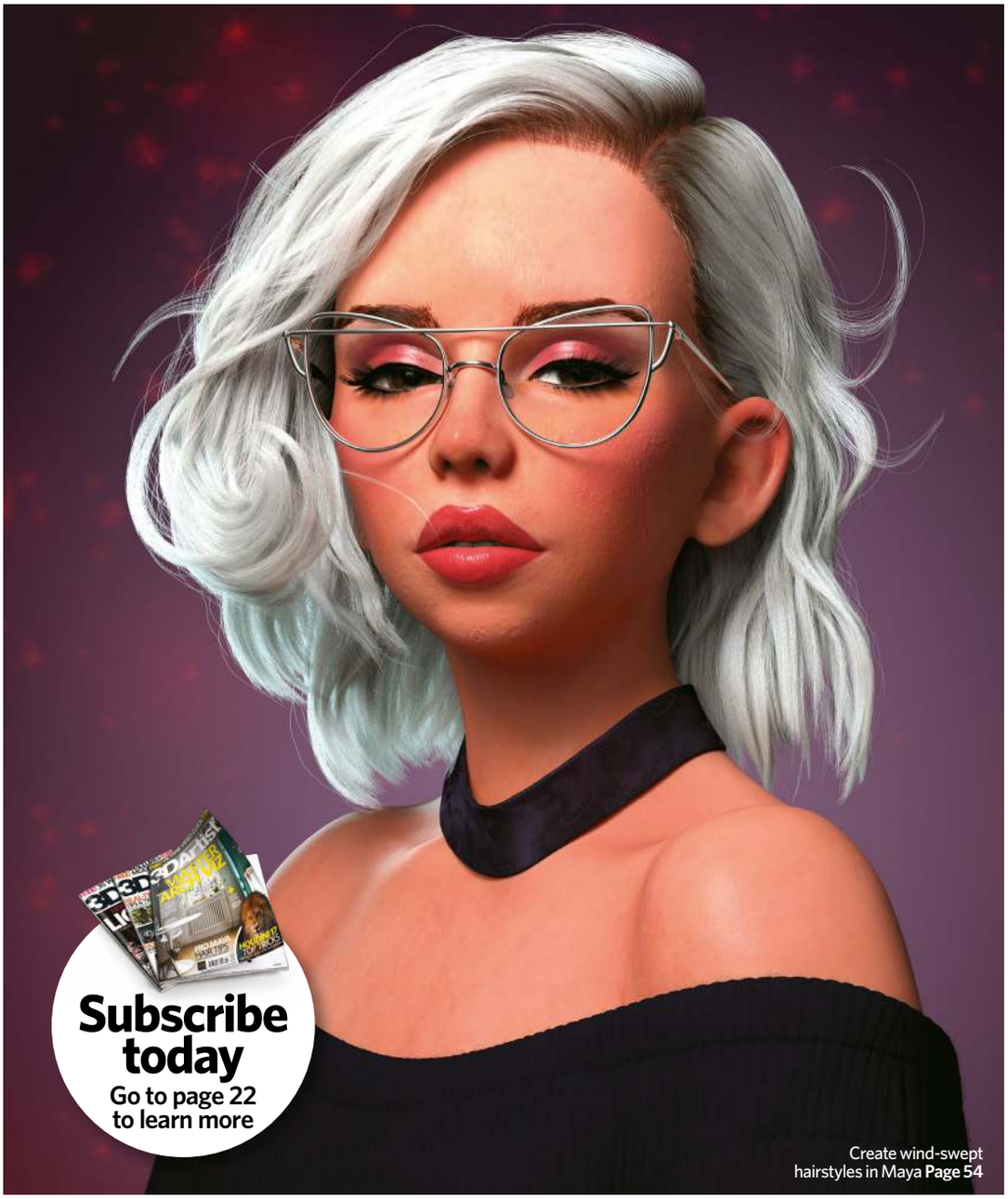
FUTURE

ISSUE 126

ALEX LANGLETZ
alex-langletz.de

Software 3ds Max, Corona, Photoshop

27 tips on arch viz
Page 24



Welcome

Whether you create interior or exterior architectural visualisations, or even if you're from a different discipline and just interested in upskilling, it helps to keep yourself up to date with techniques! That's why we've gathered top tips from a whole host of studios to help you build your best renders yet on page 24.

With the release of Houdini 17, we've also teamed up with SideFX to get as many tricks as we can for the new version of Banshee! You'll learn how to master new features like Vellum, as well as material-based fracturing, new UV tools for autoseams, improved terrains and white water solver and more on page 40.

If you're a beginner you can also make use of Houdini with our starter tutorial on page 60. It comes with a useful cheat sheet!

Elsewhere you can hear from Jellyfish Pictures, create interesting hairstyles in Maya and XGen with Crystal Bretz, texture tyres in Substance Painter with Amaru Zeas, create mountains in Octane (and learn from the free Octane training video included with this issue) with Jesus Suarez, discover how Disney is harnessing real-time engine Unity and more.

Enjoy the issue.

Carrie Mok, Editor

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The Expert Panel

This issue's team of pro artists...

ALEX LANGLETZ
alex-langletz.de

Alex is a 3D artist and his amazing visualisation skills has landed him our cover art this month. He's also given us his top arch viz tips alongside a whole host of other experts on page 24.
3DArtist username N/A

SHAYLEEN HULBERT
artstation.com/shayleenhulbert

Character artist Shayleen divulges her top techniques for taking a character concept from 2D into 3D with plenty of production-ready tips. Read her tutorial on page 46.
3DArtist username N/A

CRYSTAL BRETZ
crystalmodelsthings.com

Crystal is a modeller at Method Studios, and when we saw S W I R L Y 3D on Instagram we knew we had to get it in the mag! Find out how she created the character's hair on page 54.
3DArtist username N/A

TYLER BAY
tylerbay3d.com

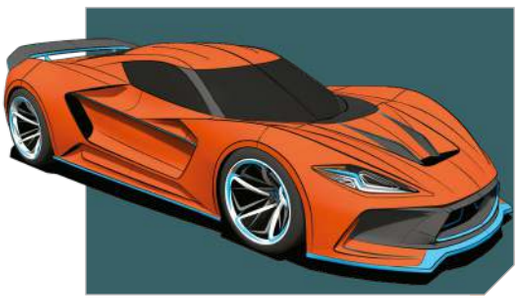
Tyler Bay has worked on projects including Pixar's *Coco* and teaches online at **cgcircuit.com**. He's kindly written a beginner's guide for Houdini on page 60.
3DArtist username N/A

AMARU ZEAS
amaruzeas3d.com

Amaru is a senior 3D artist working at Amazon Game Studios, so we thought he'd be perfect for explaining how to achieve incredible texture details for tyres. His guide is on page 64.
3DArtist username amaruzeas

JESUS SUAREZ
jesussuarez.tv

Senior motion designer and 3D generalist Jesus Suarez talks us through how he created these amazing mountain terrains in Cinema 4D and Octane Render on page 68.
3DArtist username jssuarez



PAUL CHAMBERS
paulchambers3d.com

Paul is a freelance CG generalist with plenty of experience in virtual reality. He's taken a look at 3D VR design tool Gravity Sketch and finds out whether it's worth a download on page 72.
3DArtist username paulchambers3d

IAN FAILES
vfxblog.com

VFX journalist and regular **3D Artist** contributor Ian has spoken to Simon J Smith on real-time directing and Unity for Disney's latest shorts – *Baymax Dreams*. Learn more on page 92.
3DArtist username N/A

ORESTIS BASTOUNIS
twitter.com/MrBastounis

Orestis is testing another Lenovo machine for us this issue, but this time it's the ultra lightweight ThinkPad P1. Find out how it compares to others on the market on page 74.
3DArtist username N/A

Introducing DaVinci Resolve 15, revolutionary tools for editing, color correction, audio post and now VFX, all in a single application!

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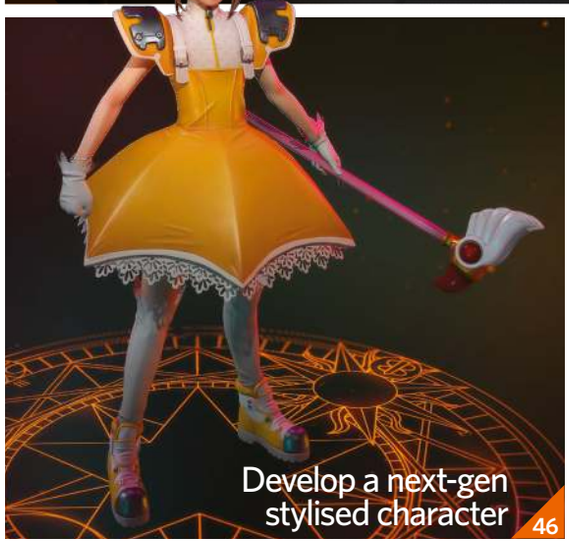
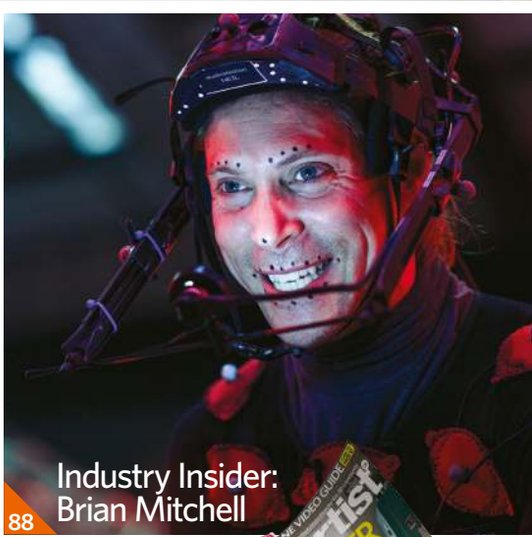
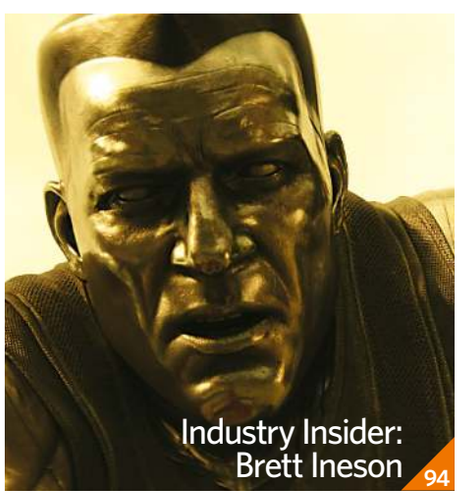
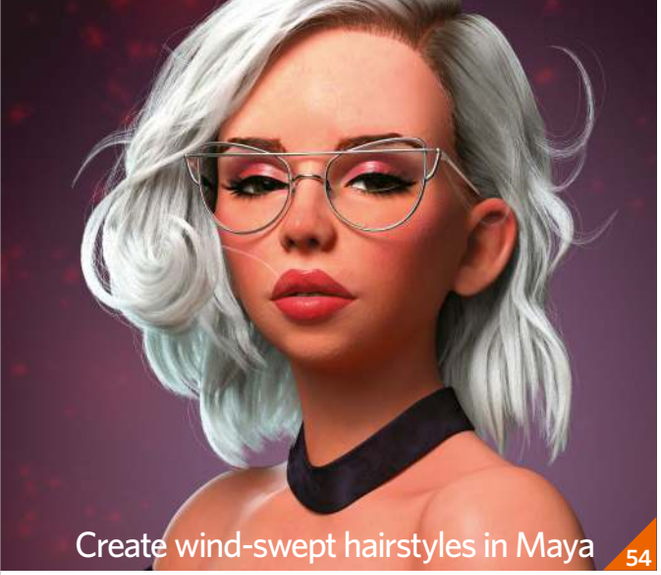
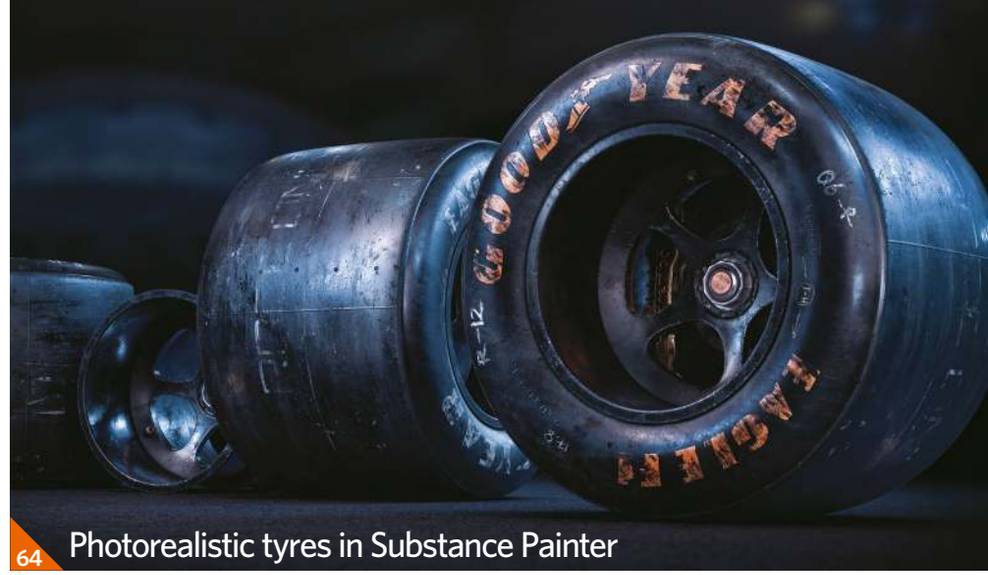








Create wind-swept hairstyles in Maya 54



64 Photorealistic tyres in Substance Painter

"We've been pioneering in the cloud and tech world for years"

Phil Dobree, CEO and founder of Jellyfish Pictures on the rise of the studion **Page 34**

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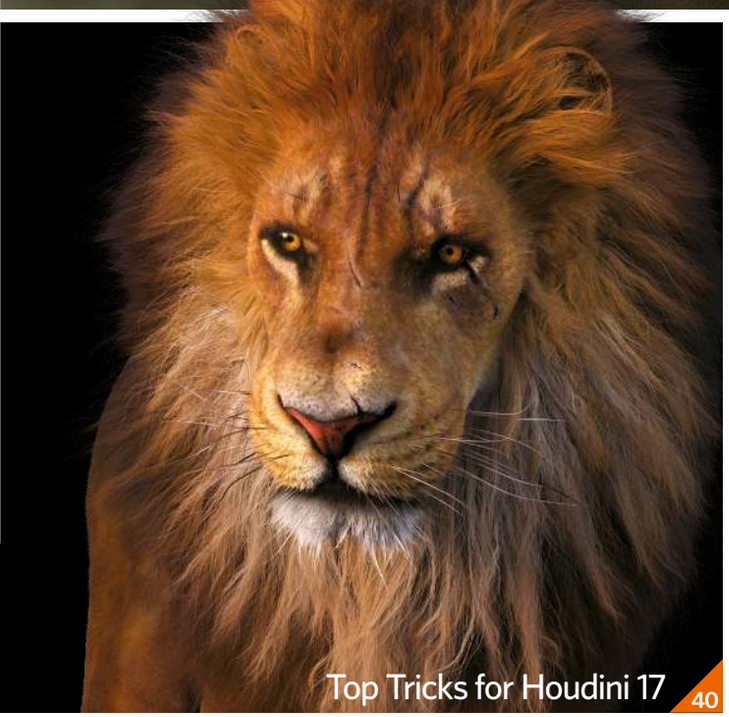

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ISSUE 127

NEXT MONTH

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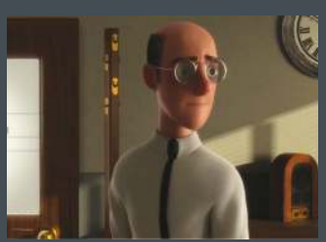

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The Gallery

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Javier Perez
meshmodeler.artstation.com

Javier is a senior environment artist currently working at Intrepid Studios. He's worked at Infinity Ward, Kojima Productions and Sony Online.

Software Substance Designer

Work in progress...

"My goal for this project was to create a convincing image that looked to be modelled in 3D, but was actually all texture work. The bees were a test for me to see how much I can push what is possible inside Substance Designer"

Javier Perez,
Not The Bees!, 2018

“This work is a 3D interpretation of the wonderful work by Chris Ryniak and Amanda Louise. I always to wanted make something like this, but never found a great concept. When I first saw the art of Chris and Amanda it was love at first sight”

Ale Barbosa,
Opulent Kelpy Bilge Guppy, 2018

Ale Barbosa
artstation.com/alebarbosa

Ale is a senior 3D artist at Vetor Zero/Lobo in Brazil. He lives in São Paulo and has 12 years of experience with 3D art.

Software ZBrush, Substance Painter, V-Ray, Maya

Work in progress...

> I'm always trying to learn a new tool or software with each project I work on. With the grapes I pushed further into Substance Painter and found myself really enjoying it

Rusty Currier,
Moody Grapes Still Life, 2018

Rusty Currier
curriercg.com

Rusty is a CG generalist that focuses heavily on modelling, look development and lighting.

Software Maya, Substance Painter, ZBrush, V-Ray, Photoshop

Work in progress...

Romain Chauliac
wizix.artstation.com

Romain is a self-employed CG generalist. For 15 years he has indulged his passion for 3D imagery and recorded tutorials.

Software Maya, Megascans, Arnold, Marvelous Designer

Work in progress...

"I launched a CG contest for my Discord community on creating a moody Asian street. In order to participate and show a workflow example, I decided to make one myself. I chose a photograph to replicate it as accurately as possible, and then add my own mood too"

Romain Chauliac,
Blue Alley, 2018

Vladimir Minguillo
artstation.com/vmb

Vladimir is a senior VFX modeller. He's worked on movies such as *Avengers: Age Of Ultron* and *Exodus*.

Software ZBrush, Maya, XGen, Arnold

Work in progress...

"I created this image to explore different techniques for achieving a photorealistic portrait. As a senior modeller, I sculpt photorealistic characters on a daily basis but have never had the opportunity to work on texturing, grooming and lighting. This image is the first in a series of photorealistic portraits I'm planning to make"

Vladimir Minguillo,
Pink, 2018

“A project of a Scandinavian-style dining room with a kitchen studio made for the Evermotion Archinteriors vol 45 collection. The goal was to create a bright, ascetic-coloured interior, ready to be rendered from several points of view”

Barbara Witkowska,
B&W apartment, 2016

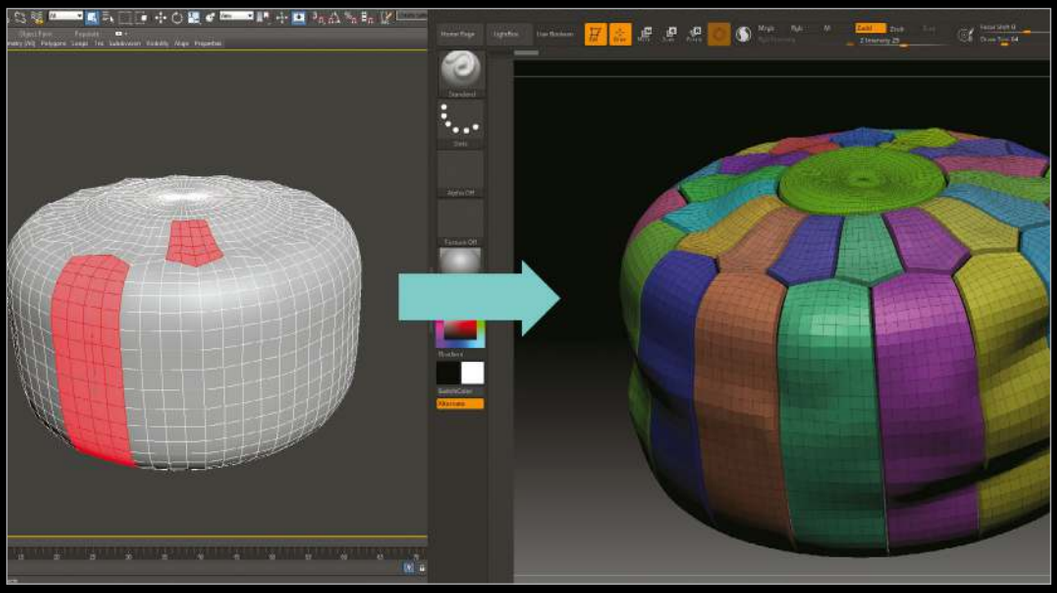
Barbara Witkowska
barbarawitkowska.artstation.com

Barbara from Białystok, Poland is a 3D/2D generalist with over ten years of experience.

Software ZBrush, 3ds Max V-Ray, Photoshop

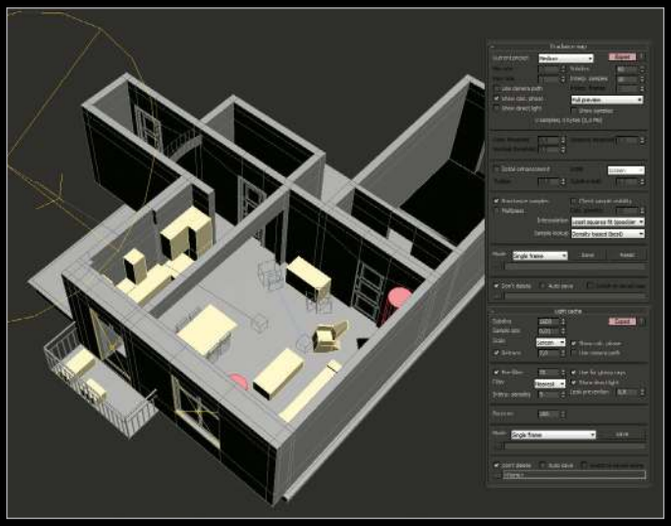
Work in progress...

MATERIALS
The wooden chair is painted green using two black and white masks one on top of the other. You can add as many layers as needed with a V-Ray Composite node. This way you can mimic Substance Painter texturing techniques within 3ds Max.



MODELLING
The base models of both poufs were made in 3ds Max. The one shown on the picture is just a simple cylinder with some vertices scaled down to obtain wavy edges of patches. Each patch was extruded and a line between them served as stitching. Overall contour was tweaked in ZBrush with just a few Standard Brush strokes.

DETAILS
Models don't need to be super dense to look good. In fact it's easier to work with simple ones. Keep in mind that paying attention to contours and adding some details here and there really pays off. When modelling this table I made sure a tabletop is curved down a little. Simple boxes with a noise modifier simulate welding marks.



LIGHTING AND RENDER SETUP
I lit the scene with V-Ray Sun and Sky along with V-Ray Sky Portals. They're crucial when it comes to delivering photons into a closed area. White interiors tend to produce light artefacts. To prevent that I switched on the Retrace option, which increased render time but eliminated lighting bugs in the corners.

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27 WAYS TO BUILD BETTER ARCH VIZ

Leading industry experts gives us some of their top tips for creating internal and external architecture visuals

An industry which has been revolutionised by 3D design software over the last couple of decades is undoubtedly architecture. Where once a creative would brief clients with a 2D image or a scale model, now a living, breathing, 3D representation can be created that's perfect right down to every conceivable detail.

From buildings that are perfectly to scale, to interior designs replete with nuances such as scratches and other realistic features, the possibilities for realism are almost endless.

But unlike some other aspects of design, architecture visualisation is perhaps unique in that everything everything designed and created has to look like it would be able to exist in the real world. Over the coming pages, some of the industry's leading experts share their insights on how to create architecture visualisations that leap off the page and into the cities of the future.

Park Place, Mayfair by SHH

Black timber house by State of Art Studio

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ADAM WOODWARD
CGI artist
shh.co.uk

01 TARGET AND PLAN DETAILS

Build what you want to see. For this concept, target your ideas. Prioritise what will impact your image most before diving into the most basic of set dressing. Ceilings are oddly expressive within an image, for both clutter and detail. Often times a rendering looks more towards the ceiling than the interior layout because the interiors are seen by exterior cameras as well as clients generally requesting wider views which include more floor and ceiling than a typical DSLR image would capture. **Corey Beaulieu**

02 PLAN LAYOUTS FROM TOP-DOWN VIEW

Plan your layouts from a top-down view. Nothing makes more sense visually than a room that makes sense spatially. If you try to place furniture from your camera there will always be something 'off' about the image. Placing set dressing based on the plan before finding your cameras will allow you to act as more of a photographer than a digital artist.
Corey Beaulieu

03 KEEP TRACK OF ARTIST TIME VS MACHINE TIME

Always consider your artist time as a comparison to machine time. We all want optimal scenes, monetised projects, and our best work, but we often get bogged down on best render settings, best tool for the job, etc. Consider the best tool for the job mixed with the artist vs machine time and optimise your project. **Corey Beaulieu**

04 UNLEASH REALISM WITH PHOTOGRAMMETRY ASSETS

Photogrammetry assets, such as the ones found in Quixel's Megascan library, **megascans.se**, can add an obscene amount of detail to your scenes, but care should be taken when preparing them. Make sure you use the right LOD mesh to get the most out of them from shot to shot while minimising memory footprint.
Jerry Chen

05 SET DRESSING

Don't just randomly place objects in the scene, try to think of them as part of a story. When working with interior visualisation I always try to imagine, what kind of person would live there, and place objects accordingly.
Alex Langletz

06 RESEARCH

In some situations a designer might only provide a basic sketch of their vision. Adding props and accessories to a space is a great way to bring an image to life, but done badly can also ruin an image. Research how rooms are styled. Pinterest is a great resource for finding prop inspiration. **Adam Woodward**

Kitchen interior
by Alex Langletz

07 TELL A GOOD STORY, DON'T ADD A MILLION PEOPLE

Create one main narrative that you can attach to your imagery. It's very important to engage and surprise your viewers with a clear story, always keeping a purpose. **Fredy Castellanos**

08 BUILD UP DEPTH

To avoid creating a flat, one-dimensional image, you must always consider depth. Compositionally, there are three levels of depth, so think about how to break up your image into back, middle and foreground. **Fredy Castellanos**

09 SCALE MATTERS

Introducing 3D people, or a box which simulates a person's height in a scene, can radically change the perception of a space and how proportions get read. **Fredy Castellanos**

10 SELECTIVE COLOUR ADJUSTMENT

I do this by abstracting each aspect of the image. Use a 50% Grey Solid on Luminosity blend mode in combination with a Hue Saturation set to 100% saturated in order to see the colour cast of your image and better match to your tones. **Corey Beaulieu**

11 SURFACE IMPERFECTIONS

Even if it's a 'clean' scene, small details like slightly breaking up reflections with a dirt map or adding subtle scratches on surfaces, help to make the render more realistic. **Alex Langletz**

12 TIME ALLOCATION FOR MATERIALITY

Match your time spent on each material with how much it contributes to the image. If your image is 40 per cent marble, then spend 40 per cent of the time allotted for materials on the marble. Try not to get lost in the minutiae of materiality. Overly-complicated materials create unnecessarily high render times with low or no impact to the image. **Corey Beaulieu**

13 UTILISING VRAYCURVATURE FOR TEXTURAL COMPLEXITY

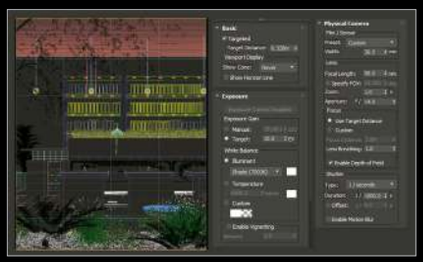
An alternative to using Substance Painter to add wear and tear to corners of your geometry is through VRayCurvature map. This procedural texture is built into V-Ray 3.0 and can add extra level of realism when used in conjunction with a Composite or Mix map. **Jerry Chen**

14 CREATE NATURAL GROWTH PATTERNS IN FOREST PACK PRO

Due to the way they propagate, the same species of plants often grow together in groups. Simulate this effect in Forest Pack by enabling the Clusters feature found in the Distribution rollout. **Paul Roberts**

15 CREATE A VIGNETTE MARKETING IMAGE

Fredy Castellanos shows us how to set up a vignette shot of a restaurant



01 Find the right composition Vignette marketing rendering is about selling an idea. In this case I want to sell the idea of comfort and intimacy in a restaurant so I first identify one of the feature seating areas, set my eye level as if I was sitting on one the chairs and then frame it with vegetation and bestow a glimpse of the bar in the background.

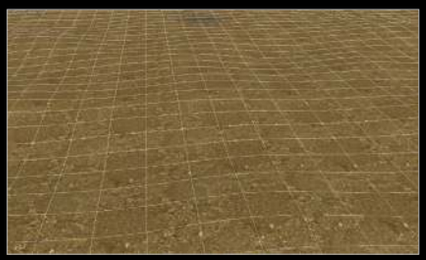
02 Set your camera and settings An important aspect when doing a vignette is to use the right focal length, which should be in the range of 70-200mm. For our restaurant scene, 90mm was used, while the camera was set to have a small aperture of f/14 and the depth of field option was enabled to have a nice blur in the fore- and background.

03 Set lighting and mood Always think about how your lights create depth/affect forms. I divided my lights into three groups: main focal point (tables), background (bar) and foreground (garden). Make sure to include different light intensities and set lights to directional mode. Finally, dial in the right temperature to create mood.

04 Post-producing your rendering in a simple way Get your base render and all necessary render elements (passes), do a quick compositing in Photoshop using blending modes, focusing mainly on enhancing lighting and reflection, then create a smart object out of all your layers and apply a Camera Raw filter.

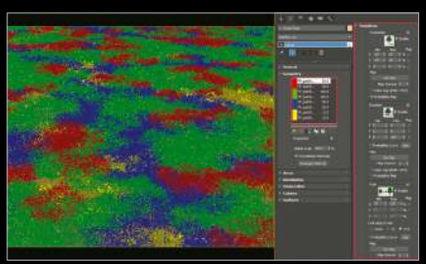
16 CREATE GRASS WITH FOREST PACK

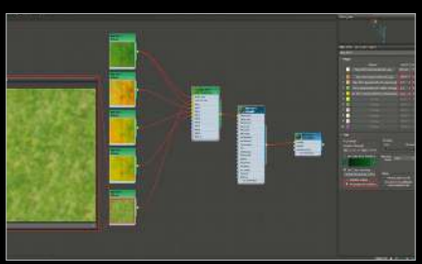
iToosoft training manager Paul Roberts walks us through creating believable grass and ground cover



01 Add noise to surfaces There's no clearer sign that grass is CG than a perfectly flat lawn, so always add a noise modifier to your terrain to make sure there's some gentle undulation. Add a high quality map to the ground too and don't be afraid to let it show through the grass in places. A perfectly even density of grass is seldom seen in reality.

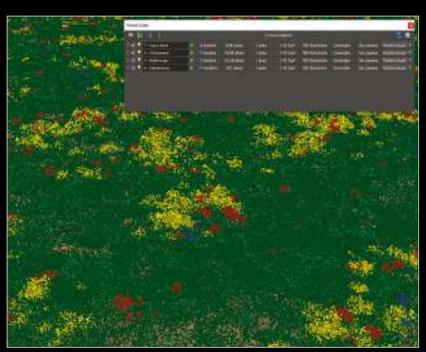
02 Create clumps of grass In order to cover large areas with grass, it's inefficient to scatter hundreds of thousands of individual blades. Instead create 25-30cm radius circular patches using Forest Pack. You can get away with one patch, but several with different grass lengths and densities creates more realistic results.





03 Scatter the patches Nest the patches in another Forest Pack object and scatter them. Use the full distribution map to create even coverage, then hide visible repetition by randomising the rotation, scale and translation. If you used patches with different densities, you can edit the probability value to control the look of the lawn.

04 Randomise the grass maps Create two or more maps, one green and healthy, another brown and parched. Add them to a Forest Colour map. Randomise the bitmaps for each individual blade by enabling Get ID by Element. To add colour variation, wire a photo to the Colour Tint map slot and change the mode to As Texture on Surface.



05 Add more plants as separate layers Now that you have a a good base layer, add more Forest objects to scatter weeds, flowers, leaves and other elements. By adding these as a separate layer you have complete control of their distribution maps and density. Controllable chaos is an oxymoron, but it's the key to believable ground cover!

Trouble in paradiso by Kilograph

Mayfair hotel
by SHH

17 SCATTER ON OBJECTS TO CREATE HEDGES

Use Surfaces and UV mode to scatter on vertical walls or nearly any geometry. For example, you can create realistic hedges and topiary in any shape by distributing individual branch models onto a mesh. **Paul Roberts**

18 FOREST PACK ISN'T JUST FOR TREES

Despite its name, Forest Pack can be used for much more than trees and plants. Scatter on floor plates to quickly populate the insides of tall buildings with people and furniture, use spline modes for parked cars or traffic and use animated particles to open up the plugin to a huge range of alternative uses. **Paul Roberts**

19 OPTIMISE SCENES FOR RENDERING

Don't forget to optimise your scenes! Use Limit By Visibility to automatically remove objects that aren't seen in the current render, and thin out their density based on distance from the camera. For further refinement, use ForestLOD to swap in faster rendering geometry and materials further from the camera. **Paul Roberts**

20 MOTION BLUR FOR MOVING CAMERAS

Always, always, always use motion blur for shots with moving cameras or animated objects. Ideally, this is rendered 'in camera', but applying in post is also an option. If rendering in camera and you are using a physically-based setup, make sure your shutter speed is set appropriately. **Matt Richardson**

21 BE PLAYFUL WITH YOUR CAMERA SETTINGS

Don't forget to add a sense of motion or shallow depth to your work by using motion blur, depth of field or even a beautiful bokeh effect in the background of your image. **Fredy Castellanos**

22 PERFECTING FOCAL LENGTH

Different focal lengths can work well in different situations for architecture and interior design. Wide values such as 15-35 are great for expansive commercial architecture as they accentuate structural lines, which can be used to an image's compositional advantage. Narrower focal lengths such as 50-135 are great for interior details when you may need to isolate furniture pieces, or to show how a set of finishes of fabrics work together. **Adam Woodward**

23 CAMERA SETTINGS FOR PHOTOREALISM

Use physically-based cameras lenses such as a 24mm, a 28mm, a 35mm or a 50mm lens as well as a DSLR-type aspect ratio such as 3:2, 4:3, 16:9 or their inverse to get your image over the initial hump of 'is it real?'. **Corey Beaulieu**

24 LIGHT SETTINGS FOR PHOTOREALISM

Expose your camera to the environment light alone before adding artificial lights (at least in most instances). Remember that artificial lights will not be as strong as your environment and should not overpower the image brightness. Photoshop can brighten a balanced image all at once while an imbalanced image will require many masks that add to the over-processed look of renderings. **Corey Beaulieu**

25 DON'T BE AFRAID TO MAKE MANUAL ADJUSTMENTS

Sometimes, in the final render a tree might not quite be in the right place, or be too big, or the wrong species. Use Item Editor mode to refine your composition by adding, deleting and editing individual objects without losing instancing. **Paul Roberts**

Dei Fiori Camping Village by State of Art Studio

26 HAVE MORE CONTROL DURING POST-PROCESS WITH VRAYBUMPNORMALS

The main benefit of using VRayBumpNormals over the typical VRayNormals render element is the inclusion of Bump map from your shaders. It's worth it to include this pass to adjust, relight, or enhance directionality of any objects in post-production. For example, those working in 3D may integrate better with a slight lighting enhancement based on your scene. **Jerry Chen**

27 SET THE BACKGROUND TO BLACK

When rendering with an alpha channel, always set the background to black, otherwise you will get undesired fringing when compositing. An example of this is rendering a sky in the environment slot. Unless you ignore the alpha channel completely, if you try to replace the background in post, you will notice fringing around the edges of objects. **Matt Richardson**

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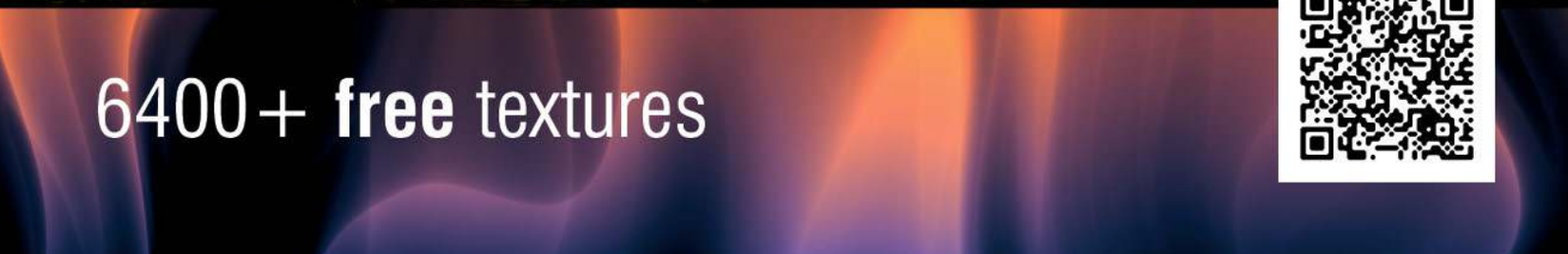
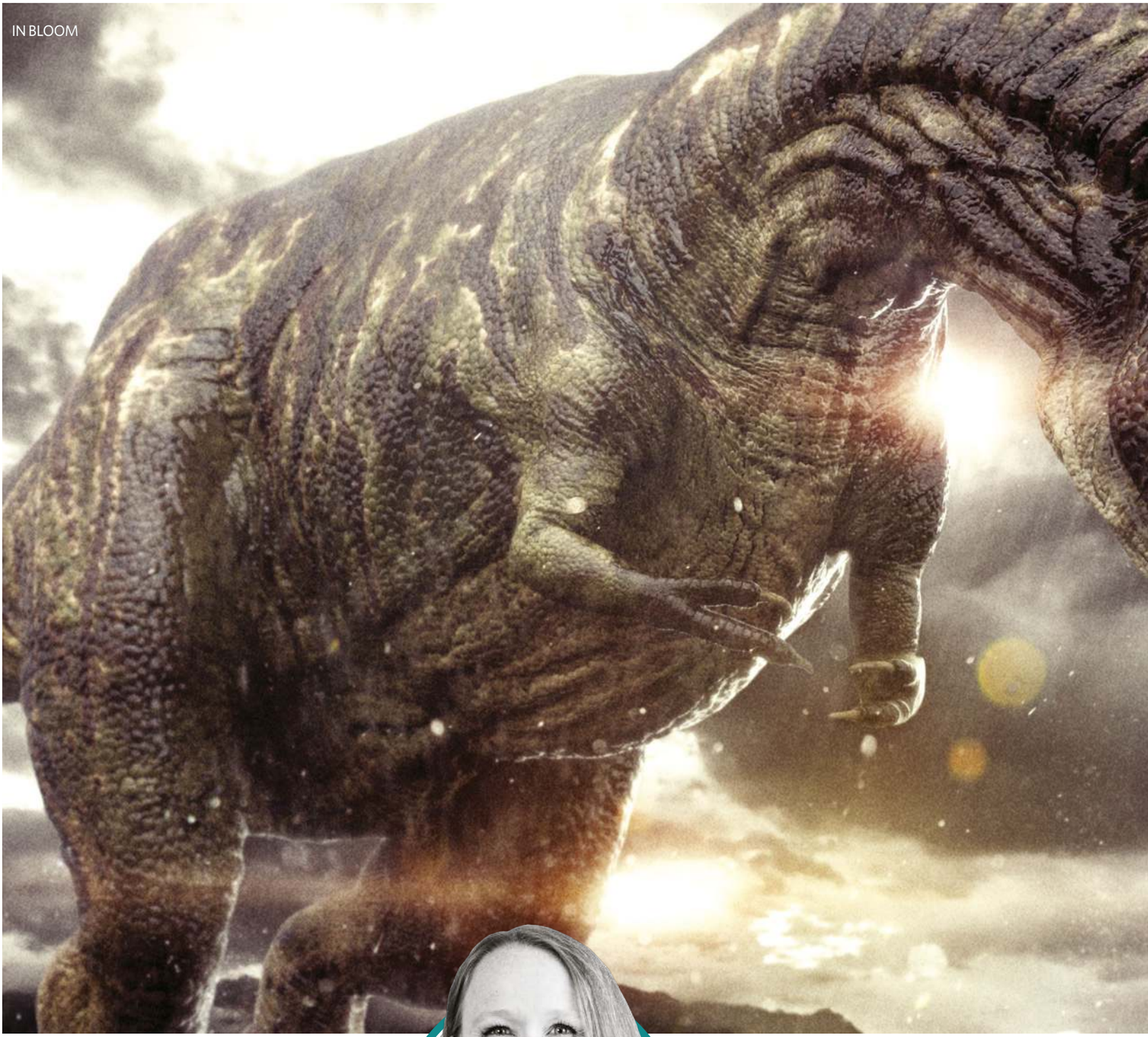


Jellyfish began work on *Bitz & Bob*, a major animated production co-produced by CBeebies Productions and FremantleMedia Kids & Family, in October 2016

In BLOOM

3D Artist visits Jellyfish Pictures to find out how it became one of the VFX and animation industry's most respected vendors

Did you know that jellyfish are among the oldest multi-organism animals to ever exist on earth? They've weathered all the changes to their environment and continue to thrive. It's a quality that London-based studio Jellyfish Pictures shares with its namesake. Since 2001, Jellyfish Pictures has been honing its craft and finding new ways to explore creativity throughout all the ups and downs of the industry around it. Not only that, but Jellyfish has done it all independently. Almost two decades later it boasts an impressive portfolio that spans visual effects in film and television, long-form animation, motion graphics and visual development.



Currently Jellyfish works from state-of-the-art studios in Central London and Brixton, which houses its physical graphics workstations. When opening two further studios in Oval, South London, Jellyfish decided against on-site servers and storage, opting to build a private VFX cloud in its Brixton office and creating Europe's first-ever virtual studio in the process.

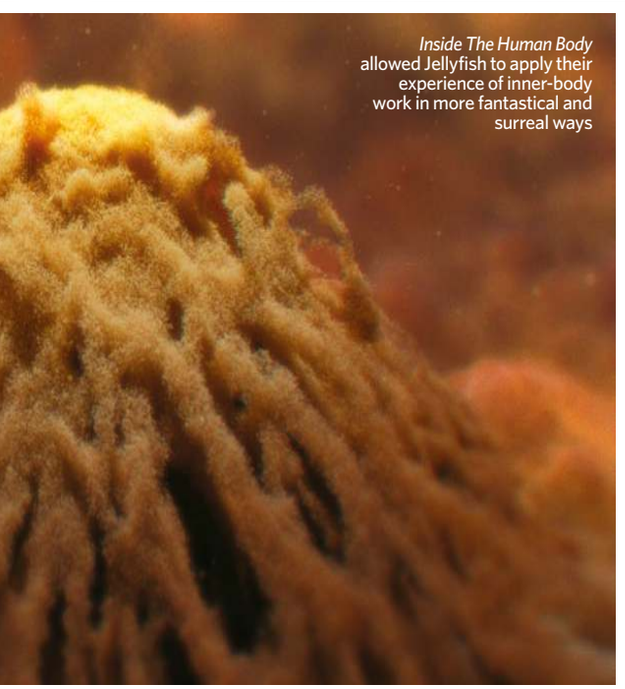
For CEO and founder Phil Dobree it's just one of the advantages that comes with being an independent company. "We can make decisions very quickly. We've got a really good CTO [Jeremy Smith] who's very forward thinking and loves new ideas. We've been pioneering in the cloud and tech world for years," he says. But as he goes on to explain, it hasn't always been easy for Jellyfish Pictures to maintain its independence in a volatile industry.

"As an independent company you are very vulnerable to the ebbs and flows of the particular economy that you work within,"

"We have a great creative culture and we are united in our passion for visual storytelling"

Natalie Llewellyn,
head of development

Tom Brass states that every dinosaur in *Planet Dinosaur* was designed to tell a story visually, through physical attributes such as scars or injuries



Inside The Human Body allowed Jellyfish to apply their experience of inner-body work in more fantastical and surreal ways

> We have also implemented Unreal Engine in our animation pipeline
>
> **Luke Dodd,** COO

explains Dobree, reflecting on the earliest days of Jellyfish. Past experience had taught Dobree what could happen when companies weren't careful and it's a lesson he has never forgotten. "We'd been in a company where everything had gone tits up. So we started small, we had a really low cost base and a few clients," he continues. "We bided our time and started to build our portfolio of work."

There wasn't much call for visual effects in dramatic television during the mid-Noughties, in fact it was largely being embraced by documentaries. "We plugged into what the market was dictating at the time, which meant doing a lot of commercial and promo work, but we really made our name through factual TV," Dobree recalls.

Among its early achievements was the BBC docu-series *Fight For Life*, which explored the human body's fight for survival in life-threatening situations. "We did a lot of human

body work and really pushed the boat out as a hungry company wanting to do something new," says Dobree.

Its efforts saw *Fight For Life* nominated for a plethora of awards alongside small-screen giants like *Doctor Who* and *Battlestar Galactica*, most of which it would win. But Jellyfish's ability to capitalise on this success was hindered when 2008 brought with it a global financial crisis. "We managed to hang in there but one or two visual effects studios certainly started to go under," recounts Dobree. "Part of running a company like this is that you have to be prepared for the worst and hope for the best. It's a cliché, but you have to."

ON THE UP

2009 saw things begin to look up as the studio moved into its current home in Margaret Street, central London. Dobree continues, "Our capacity increased from 25 to 45. We started to get more work and make contacts." It was around this time that creative director Tom Brass would join the team, as a writer on their next big project, *Planet Dinosaur*.

"I was originally hired by the BBC and then slowly migrated throughout the course of the 18 months to being an art director here at Jellyfish, which I was for a long time. Then I became the full on creative director of the company three years ago," explains Brass. *Planet Dinosaur* would prove to be a ferocious challenge for the studio, as Dobree explains, "We had to get another floor here so our capacity went up to 70 or 80. It was a really challenging budget for a huge amount of work, it was six half-hour [shows], full CG. When we started it there were no stories, there was nothing, we just knew we had to produce three hours of prime-time television about dinosaurs."

> "We made the most realistic and emotive reconstruction of a neanderthal"
>
> **Tom Brass,** creative director

"We had the BBC team in here and we worked closely with them to come up with a series and it worked. It was a fantastic thing for us to do, it got us really tuned in to having a big CG pipeline and understanding what it takes to produce a lot of work fast. We still have the core of that team with us now."

From here on out Jellyfish Pictures was in full bloom, collaborating with filmmakers to make their visions a reality. "We're not the sort of company that's just a service provider," Brass points out. "We like to get involved with the creative approach to telling a story. As a creative director I have to spearhead that input and be the frontline in working out how we're going to achieve something visually."

When recently appointed head of development Natalie Llewellyn joined the company nine months ago, this kind of collaborative relationship with creators was just one of the things that made Jellyfish a unique proposition amongst its peers.

"We have a great creative culture and we are united in our passion for visual storytelling. Yet we are pragmatic in our approach and we can think like our clients," she says.

"With such awesome talent across visual effects, animation and design development, we are able to offer creative solutions to match a client's vision, budget and schedule. It's this ability to flex and react that makes us such a good studio to work with."

Notable among their returning collaborators is director Gareth Edwards, "He's a good friend and very supportive. That relationship has

RESURRECTING EARLY MAN

The process behind the most accurate recreation of a neanderthal to date

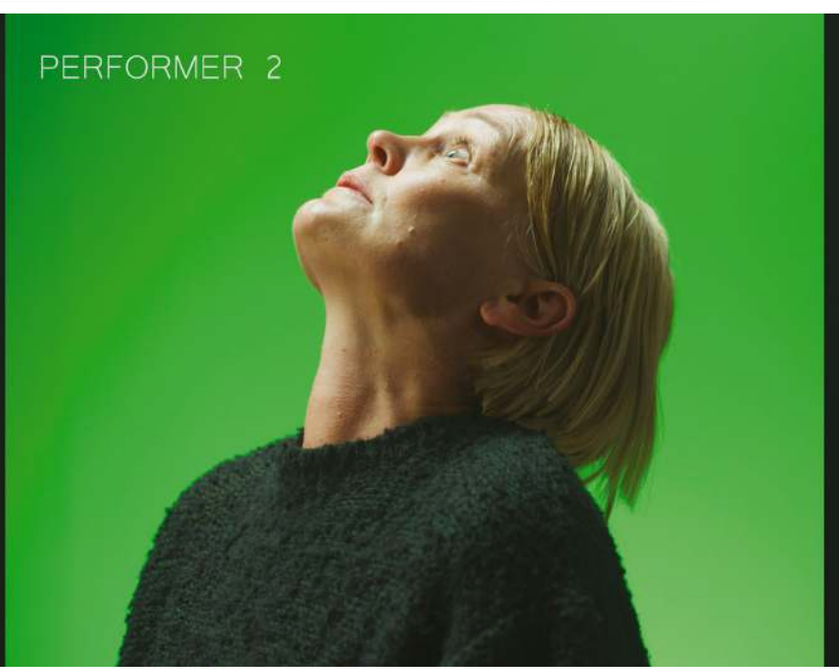
"The director of *Neanderthal: Meet Your Ancestors* came to us and said 'I need to see neanderthals doing all of this stuff and I don't want it to look like a documentary'," explains Tom Brass, creative director. "He had the faith to let us put together a complete visual pitch for it. We made the most realistic and emotive reconstruction of a neanderthal that has ever been seen."

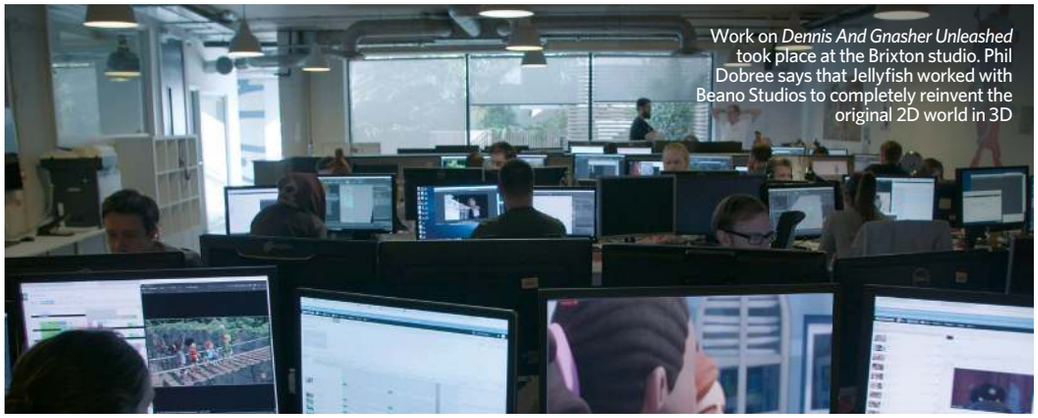
Recounting the creative process he says, "We were given a scan of a real neanderthal skull, that then went to a forensic artist in Duncan of Jordanstone College up in Dundee and he did a full reconstruction of all of the musculature." The team now had a scientifically accurate yet sterile neanderthal head, but they needed to inject some humanity.

Brass continues, "We scanned an actor who had this beautifully craggy skin. He pulled loads of expressions to get all the wrinkles. Then we used that texture on our model, giving it incredibly fine-grained detail. You can go down to each individual pore, it's all there."

Luke Dodd highlights *The Innocents* as the most complex and fascinating project he's undertaken during his time at Jellyfish

Actor Andy Serkis and archaeologist Ella Al-Shamahi also worked on *Neanderthal: Meet Your Ancestors*, which debuted on BBC 2 in June in the UK




Work on *Dennis And Gnasher Unleashed* took place at the Brixton studio. Phil Dobree says that Jellyfish worked with Beano Studios to completely reinvent the original 2D world in 3D

recently led to us working on all the *Star Wars* movies," says Dobree. "He wanted us to be involved in his film on whatever basis. So we did a lot of the post-vis for *Rogue One*, Lucasfilm was really impressed with us and wanted us to do 100 or so shots. Then we worked on 150 for both *The Last Jedi* and *Solo*."

As if crafting visuals for a galaxy far, far away and a host of other Hollywood productions wasn't enough, Jellyfish also made its first forays into the world of children's animation five years ago. Dobree explains, "The government introduced UK animation tax credit and we've always been pretty good at character stuff. We thought 'right, the margins are challenging, but the tax credit will help us get it made'."

With four successful shows in as many years, it's a move that appears to have gone well and has allowed Jellyfish to aid the growth of homegrown children's animation in the UK. "You can bring through a lot of talent that is fresh out of college. With animation you've either got it or you haven't.

"It's not such a technical task it's more about performance. Being able to find those new animators and bring them into the industry has been really good for us."

In fact, as the boss of a hugely successful independent company, supporting the UK industry is something Dobree feels very passionate about. "Jumping to the next level would basically mean opening a studio in Canada, I made the decision not to do that a while ago," he states. "It just seems wrong to be chasing tax credits around the world. The whole reason the UK tax credit is here is because we worked hard to get it, to grow the industry here. Never say never, but this is our home, so this is where we want to try and make it work."


The servers for Jellyfish's virtual Oval studio are all housed in their Brixton hub, it was Europe's first example of a virtual VFX studio


Phil Dobree says that artists are never too young or old to succeed at Jellyfish


Phil Dobree and Jellyfish Pictures are big supporters of the VFX industry in the UK

GOING ITS OWN WAY

Jellyfish is now looking to dip its tendrils into creating original IPs and Brass is busy overseeing their development. "In the animation space, a lot of companies act as a service provider for production companies," he says. "The natural progression is to start making your own work because you've got the talent and you've got the infrastructure, all you need is good ideas and good stories to tell. Turns out that's the really fucking difficult bit."

That's where recently appointed head of development, Natalie Llewellyn comes in. "I've been very fortunate to have experience of the whole IP journey – from concept, development and production through to international programming sales and character licensing. This experience really benefits my role at Jellyfish," says Llewellyn.

The role essentially entails Llewellyn leading all the efforts in the creation of IPs. As of right now her focus is on growing the development slate and getting projects pitch-ready, whilst also identifying potential co-production partners and international broadcasters. "We proved that we have the technology, talent and capacity to run multiple projects at any one time. Now there is a desire and energy to create, produce and manage our own content."

It's not something that happens over night, however, as Llewellyn explains, "Developing an original IP is a marathon and not a sprint for any company. It takes a long time with a significant amount of financial and creative investment to develop a property, win a broadcast commission and get a show fully funded into production. But if successful, the upside is that we own the IP and can benefit commercially from that property. We put no less love into shows we make for other producers, but it's wonderful to be able to say we lovingly made that show and it's ours."

Quite unlike its namesake, the sky appears to be the limit for Jellyfish Pictures and the future looks set to be very exciting indeed. "Speaking of investing in the UK, we're setting up a big new studio in Brixton," announces Dobree. "There's 160 people going in there. That's a big call to make and such an important part of our future. That'll be happening in about a year." There's also a slate of television and a feature film in development, details of which Dobree says are strictly under wraps. "Let's just say we're highly ambitious," he smiles.

TOOLS OF THE TRADE

Jellyfish Pictures' COO Luke Dodd talks us through their softwares of choice

"We mainly use Maya and Nuke across our VFX and animation work," explains COO Luke Dodd, who is responsible for three key areas of Jellyfish's business: talent, pipeline and production. His role entails spending vast amounts of time talking with artists and supporting their creativity. Dodd continues, "For modelling and texturing we use a combination of ZBrush and Mari with support from Photoshop. We then render using Arnold, Redshift and V-Ray."

Dodd stresses the importance of giving artists the latest software and providing them with the best technical to any given project, the result is a pipeline that's constantly evolving. "We have also implemented Unreal Engine within our animation pipeline. Both Yeti and Houdini are utilised on FX work, whilst our motion graphics department is built on Photoshop, After Effects and Cinema 4D. Finally we use Shotgun for our production management which is a large part of the Jellyfish pipeline."

TOP TRICKS FOR HOUDINI 17

Discover how to upgrade your physical simulations with the latest release from SideFX

Banshee, the latest version of Houdini from SideFX, may just be the most powerful release of the physical simulation tool yet. New to Houdini 17 are a host of key features including a new Vellum multi-solver for creating fast cloth, as well as hair, soft bodies and grains. Material-based destruction tools also make it simpler to set up destruction and art direct too. Other new tools like Soft Constraints, Convex Decomposition will help prefracture materials including concrete, glass and wood while building constraint networks automatically to tie everything together. Another addition is that of new UV tools which automatically seam and provide accurate flattening, allowing for a fully procedural workflow.

The Whitewater Solver is also now more organic, realistic and foamy with an accurate relationship to the source FLIP simulation. Terrain now also includes updated, advanced erosion tools that provide more control over details such as fluvial lines, river banks and debris. Hierarchical Scattering now makes placement of elements more efficient, too.

Other features include Retime SOP for stretching or slowing simulated data with effective interpolation and blend options to create clean and realistic results, a PolyDraw tool for interactive modelling, a new animator-friendly timeline for character animation and a new glTF importer and exporter (based on feedback from the gamedev community), a 3ds Max plugin, a Unity v2.0 plugin and improvements to the Maya and Unreal Engine 4 plugins. So what are you waiting for? Dive in to Houdini 17 Banshee now!

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Lion made using Houdini 17

VELLUM

SUBSTEPS VS CONSTRAINT ITERATIONS

Each Substep runs a given number of Constraint Iterations. A quick way to gauge how many are needed per step is to make a rough estimate of how many edges exist across the geometry. For fast moving cloth and collisions, increased Substeps would be best. For all else, increased Constraint Iterations would be cheaper. **Sara Abril Rascón Espinoza**

PANELLING SHIRT

The main shape consists of separate curves that were fused, so each segment can be grouped and resampled independently. Planar Patch from Curves converts the silhouette into a triangulated mesh. Another curve can be placed inside the silhouette to 'guide' the topology flow or create straight lines inside the generated mesh. **Sara Abril Rascón Espinoza**

LONG HAIR

Self Collisions can be disabled for optimisation and Glue can be used in its place. This creates a network of constraints on the guide's points that propagates to nearby curves, mimicking clumping. Hairs can detach by enabling Breaking. On the solver, each Glue constraint's stress ratio can be visualised, which is helpful to see! **Sara Abril Rascón Espinoza**

SHORT HAIR

To prevent hair falling flat against the scalp and losing volume, a ramp can be used through a wrangle to create a soft falloff, controlling bend stiffness from root to tip. Another ramp was used to drive Glue and Attach to Geometry constraints, so that roots hold shape without stiffening the tips. **Sara Abril Rascón Espinoza**

MATERIAL-BASED FRACTURING

RIGID BODY PAINT NODE

The Rigid Body Paint Node stores the values of the painted areas by creating its own float attribute, which can be later transferred to the RBD Material Fracture SOP to create scatter points. Areas with dense paint will fragment into more pieces.

Additionally, using this (vs Paint SOP) will allow you to keep the painted areas even if you change the resolution of the geometry. **Sundeep Mukala**

SOFT CONSTRAINT

In a default soft constraint setup, you have stiffness and damping ratio. When the constraint's angle is higher than the given

degree (angle) value, the constraints switch and tend to break.Having more resolution to the fracture results in more flexibility, such as with bending for example. **Sundeep Mukala**

UVS

UV AUTOSEAM

UV Autoseam will try to find the optimal seams on your mesh, based on curvature. You can then plug the resulting seam selection into a UV Flatten to unwrap and start laying our your UVs. **Fianna Wong**

UV FLATTEN

In addition to unwrapping UVs, you can further edit UV islands by using Straighten Edge Loops (for example, on a leather belt) or Rectify Groups of Quads (to force as much as possible, a uniform unwrap of any UV island into an evenly scaled and straightened quad-filled UV island (eg bricks). **Fianna Wong**

UV LAYOUT (PACKING)

You can now specify rotation increments for your UV island rotation iterations, and even newer, you can pack UVs to be even tighter by using Stack Identical Islands (overlaps same UV islands) and if your mesh has symmetry, use Match Mirrored Islands for maximum cram (flips and overlaps same UV islands). **Fianna Wong**

UV LAYOUT (UDIMS)

Interactively assign and create your UDIM tiles by selecting any UV island and typing in the desired UDIM tile. Use the overrides for scaling and offset to prioritise which UDIM tile or UV island requires bigger real estate (texture resolution). This is nondestructive, so adjust freely as needed. **Fianna Wong**

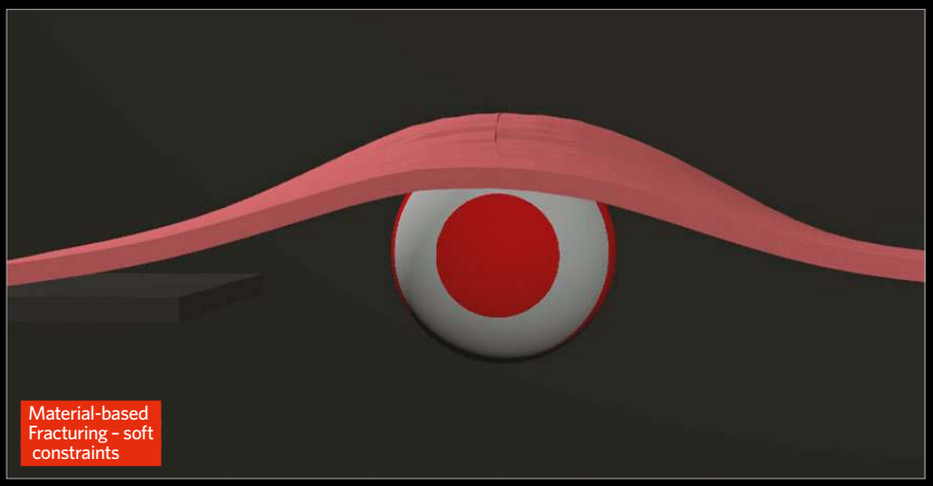
WHITEWATER

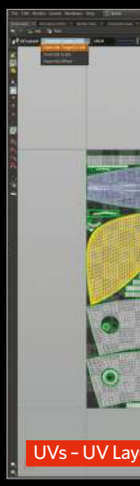
WHITEWATER SOLVER

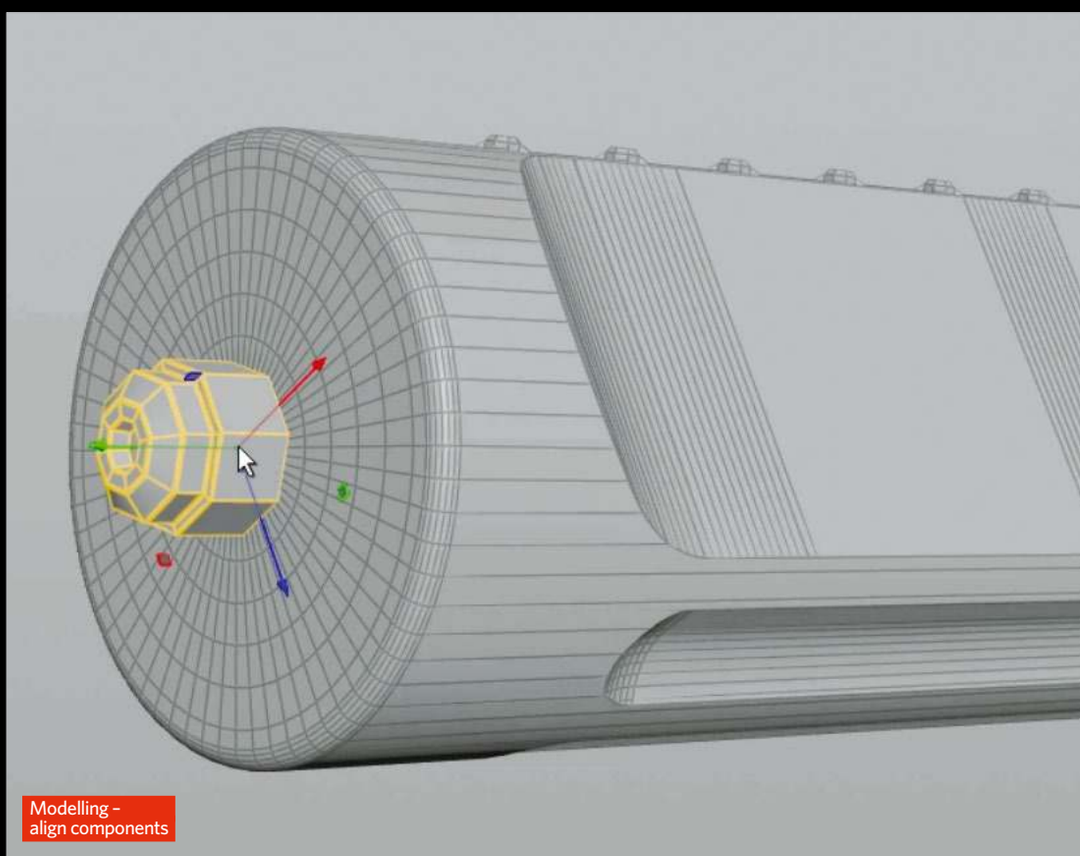
With the new Whitewater Solver, there are a lot of new attributes which are very different from the old solver. Testing these new attributes on wedge tests is the best way to learn how they work together or by themselves. Testing the same setup on different scenes is also important, because you can see how they work and whether you have the same result or otherwise. **Igor Zanic**

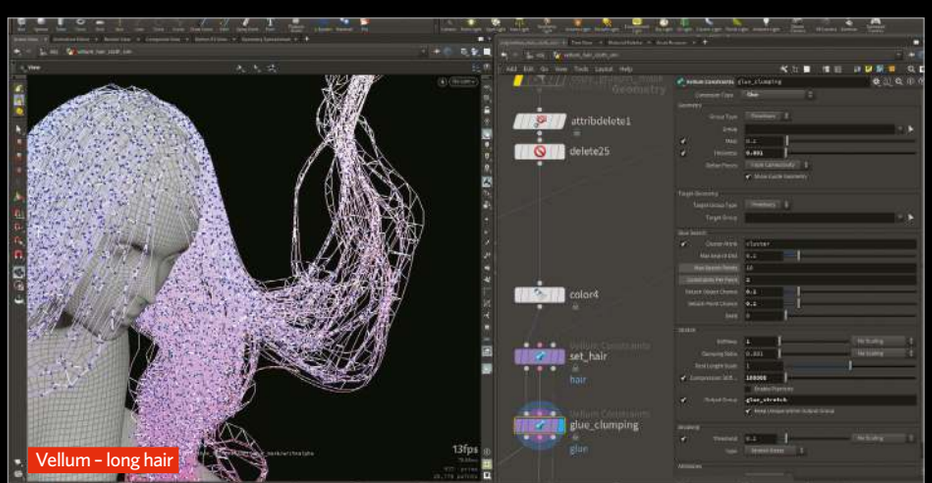
RUNNING FASTER

Using OpenCL can really speed up the simulation times, but due to memory limitation on our GPU, the sim can crash or become unstable. You can run the sim on a smaller region and get results faster than just running the final sim without OpenCL. With the new

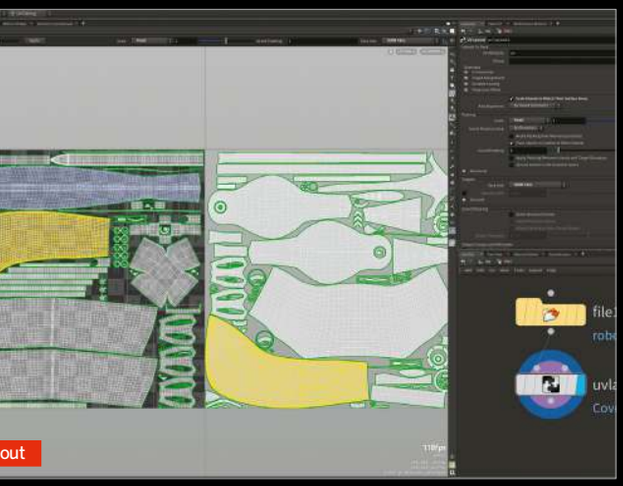

Material-based Fracturing – soft constraints

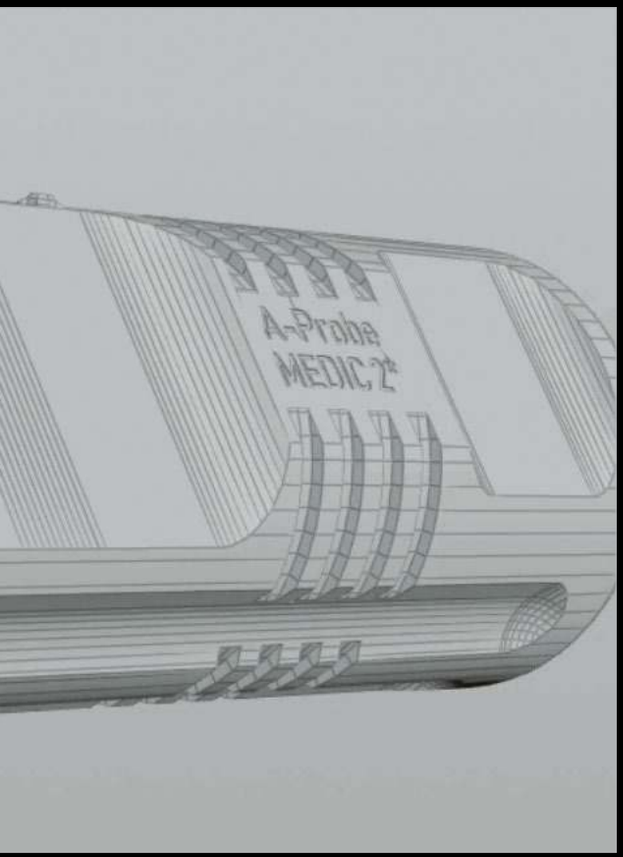

UVs – UV Lay

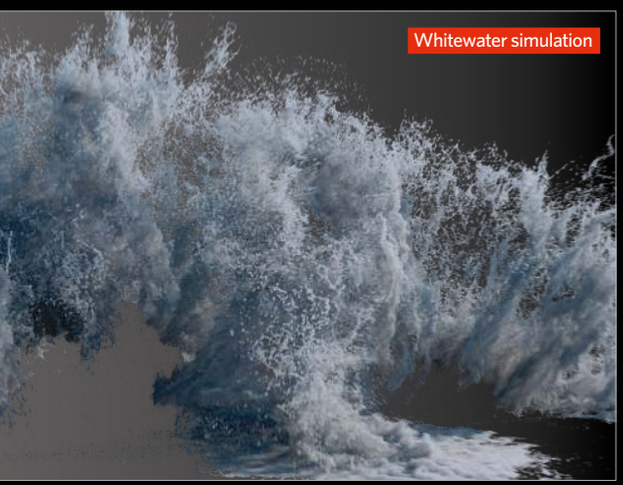

Modelling – align components



Vellum – long hair

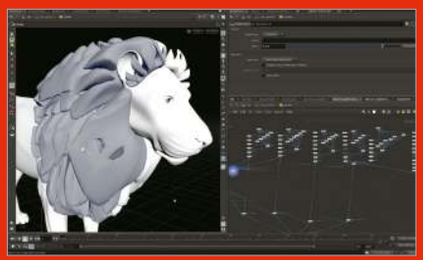






CREATE GUIDES FOR LION MANE

Learn how to create mane guides in Houdini 17 with Andriy Billchenko



01 The main forms – Guide Advect

I usually create basic forms using Guide Advect. Using various options for the advection operation and applying various geometries to the fourth input, you can very quickly create the basic shape of the hairstyle. I first used the advection operation Constrained Advection to properly direct all the little hairs along the surface of the body.

02 Mane proxy geometry

Using modelling tools, I created proxy geometry for the mane. Houdini provides many tools for this (eg Topobuild, PolyExtrude, Boolean, Edit). To more easier manipulate the guides, I created individual proxy geometry. Then, I put several Guide Advects with Fill Collision Field and included Output Group of Affected Primitives.

03 Refinement and randomisation

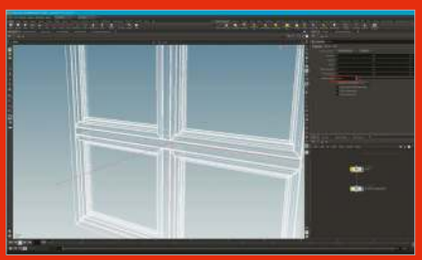
Now using the groups that I created in Guide Advect, I can refine the shape of the mane by editing each part separately. For this, I used Guide Groom by alternately switching between primitive groups in the Initial Setup Primitive Group. Then I used Hair Clump to make clumps and curling. I used the Guide Mask for masks and the Guide Process for randomisation of length, bend, frizz and so on.

04 Don't be afraid to experiment

This is the main set of operators that I made use of to create guides for the lion's mane. Of course, you can do it in a completely different way. Do not be afraid to experiment. This is the beauty of Houdini. It gives you a limitless amount of possibilities for your imagination. Additionally, the knowledge of other areas in Houdini and VEX will expand your potential in grooming.

CREATING A WINDOW HDA IN HOUDINI

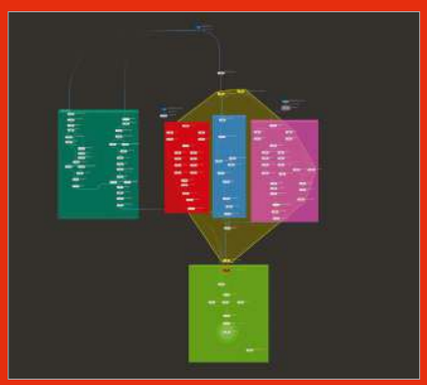
Make a parametric window asset and use it in Houdini Engine for 3ds Max with Ian Bonifacic

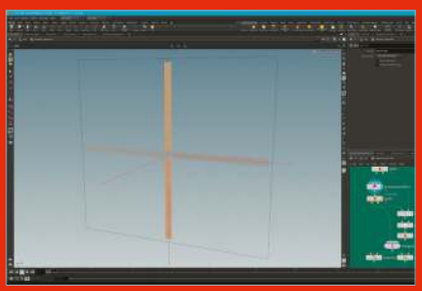


01 Plan out your HDA in advance Try to figure out how you're going to use your windows/HDA and incorporate them/it in your workflow.

Think about what you want to have as your entry data, so you can plan out your end data (end product).

02 It's all about the scale This was one of the first problems I had, figuring out the scale from 3ds Max to Houdini and back. Changing units won't help you here. The easiest thing to do is just use Transform node after the File node of your import geometry and scale everything by 0.01. After finishing your whole hierarchy, add another transform node at the end and scale everything by 100. This works perfectly.

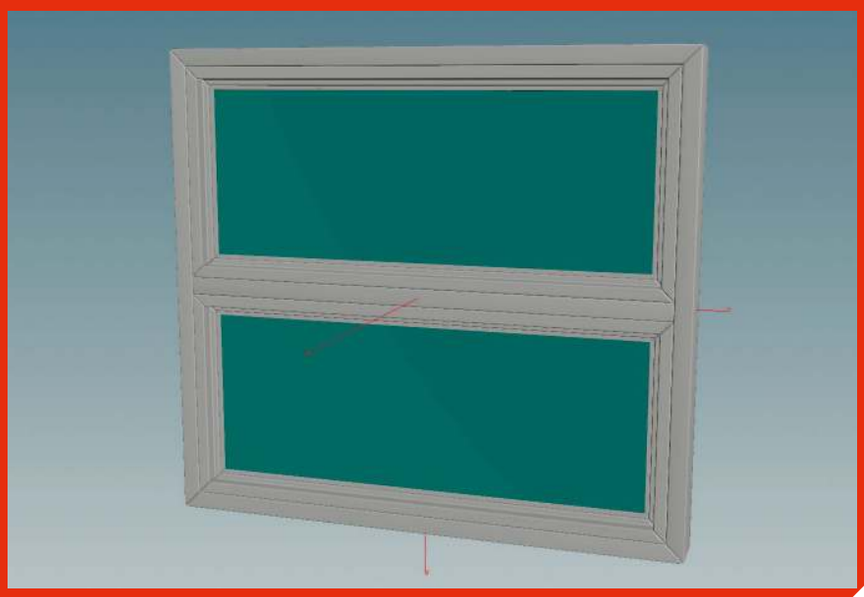




03 Segment a problem When trying to solve complicated problems, try segmenting them into smaller tasks. By doing this, it's easier to stay motivated and solve sometimes formidable tasks.

You will feel accomplishment after solving each small task, and one-by-one you will get to the end solution to your problem.

04 Groups = gold The Group node in Houdini is one of the most important features I've learnt about while developing this HDA. Group and tag everything you could possibly need for your end product (HDA). With a couple of smart groups, you can achieve limitless control, which can then be linked to your sliders in the HDA.



Whitewater Solver, you can get a more natural look than before. **Igor Zanic**

SAVING TIME

One good thing with the new Whitewater Solver is that the result is almost the same if you were to use low, mid or high res simulation, due to repellent and stiffness attributes. So you can really save on main sim times if you have different angles of your camera, but you need to maintain the same foam look. **Igor Zanic**

TERRAINS

HEIGHTFIELD ERODE

Having tons of controls on erosion can allow you to art direct the shape of your terrain very easily. The terrain generation workflow in Houdini involves starting on a low-resolution HeightField where the erosion gives you strong and deep results, which will help you to block out the shape you desire. Then, slowly increase the resolution with each erosion pass to get the fine details that can be seen in real-life terrain. Fine details are added later in High Res Erosion Passes. **Rajendra Khirodkar**

HEIGHTFIELD DISTORT

We have two distortion nodes in Houdini 17: HF Distort By Noise and HF Distort By Layer. Distort by Layer, newly added in Houdini 17, gives you control over warping and distorting features along a vector field. Use the Swirl Mode to sharpen or smooth out the top edges of your terrain. Using Distort by Layer just before a High-Res Erosion will give a very natural feathering to the erosion. Distort by Noise gives natural results when applied at the very end, usually after the last Erosion node on the highest resolution HeightField. **Rajendra Khirodkar**

CHARACTER

INTERACTIVE FOLDER TABS

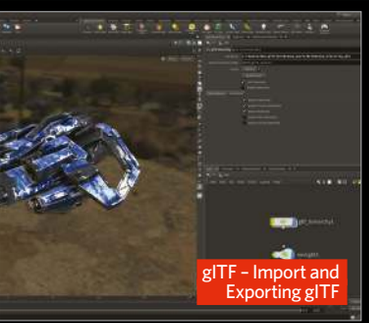
Cmd/Ctrl+right-clicking on a folder tab reveals a number of actions available to affect all channels contained within the folder. This makes it easy to perform common operations on collected channels all at once. Cmd/Ctrl+right-click on a folder tab to: set keyframes on all channels in the folder, create a channel group from the folder contents, and copy and paste channel values. **John Mariella**

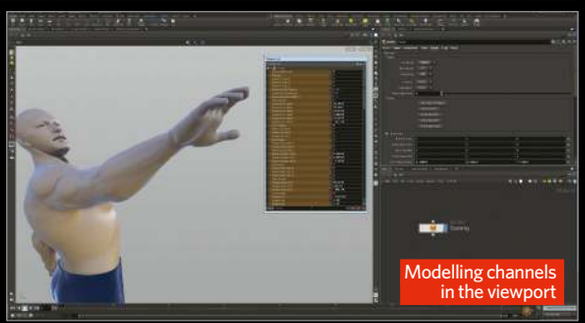
DRIVE BLENDSHAPES WITH POSE SPACE DEFORMATION

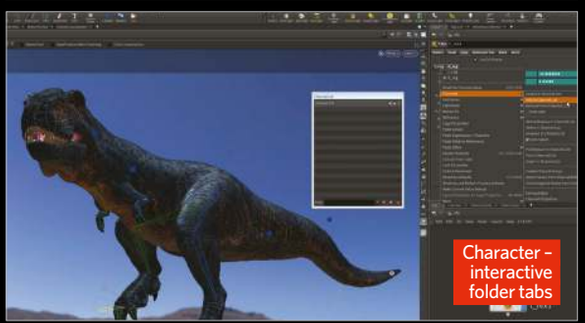
You can drive Blendshapes automatically by posing your character and sculpting the shapes your character should deform into whenever your skeleton approaches the pose joint angles. **John Mariella**


Terrains – HeightFields


Terrains – with distort by noise


gITF – Import and Exporting gITF


Modelling channels in the viewport


Character – interactive folder tabs


Terrain – high-res erosion pass


Retime SOP

gITF IN HOUDINI ENGINE

HOUDINI 17 AND gITF

GITF (GL Transmission Format) is a JSON-based open-standard file format for 3D scenes and models. Given its growing popularity, especially in game development and in real-time game engines, support for both importing gITF files and exporting geometry in gITF 2.0 format was added to Houdini 17. **Seelan Vamatheva**

IMPORT AND EXPORTING gITF

The Houdini gITF importer allows for loading in scenes with transform hierarchy or individual objects, along with their materials using Principled Shaders and Textures. Similarly, the gITF exporter can export scenes or individual objects with their materials and textures.
Seelan Vamatheva

MODELLING

POLYDRAW

PolyDraw allows you to free-hand draw polygons in an empty scene. This is useful when you need to trace base shapes using blueprints in orthographic views.

Within PolyDraw are additional tools that allow you to straighten insert edge-loops, split edge, slide along edge, smooth-relax, brush move, make circle and more.
Fianna Wong

CONSTRUCTION PLANES

You can quickly set Construction Planes to an edge or face, so that you can specify the orientation and placement of geometry to align and continue building upon. You can also bookmark up to four different construction planes, to save and jump between, when modelling. **Fianna Wong**

RETIME

SET YOUR RANGE

You have the option of manipulating your animation by Frame, Time, Speed, Shift Range and Fit Range. Use pre- and post-cycle options to loop animation cycles and zigzag if the cycle isn't fully synced. Using the Speed option is a good starting point for creating fast or slow-motion shots. **Liam Hoyle**

SET THE INTERPOLATION (SMOOTHNESS BETWEEN FRAMES)

These parameters allow you to control the blending between frames (linear, cubic or subdivision) and works best when tackling pyro and fluid simulations. To avoid unwanted pulsating, and to average artefacts between frames, make sure to use the resulting retimed and interpolated field from the tool.
Liam Hoyle

Develop a next-gen stylised character

Discover a professional approach for taking a 2D character, such as Sakura Kinomoto from Cardcaptor, and make it into a 3D model

SHAYLEEN HULBERT
Cardcaptor Sakura, 2018

Bio

Shayleen Hulbert is a freelance character artist specialising in stylised character modelling and sculpting, with extensive knowledge of current generation pipelines and methodologies for both console and PC.

Software

ZBrush, Maya 2017, 3D-Coat, Quixel Suite, Photoshop, Marmoset Toolbag

Learn how to

- Block out your model in ZBrush
- Sculpt stylised hair
- Sculpt stylised cloth
- Apply depth and life to your textures
- Pose your character
- Present your model for a professional portfolio

Concept

The concept for Sakura is from the Nineties anime *Cardcaptor Sakura*. Growing up with the show as a child I couldn't wait to recreate the look in 3D.

YOUR FREE DOWNLOADS from **filesilo.co.uk/3dartist**
- Tutorial screenshots

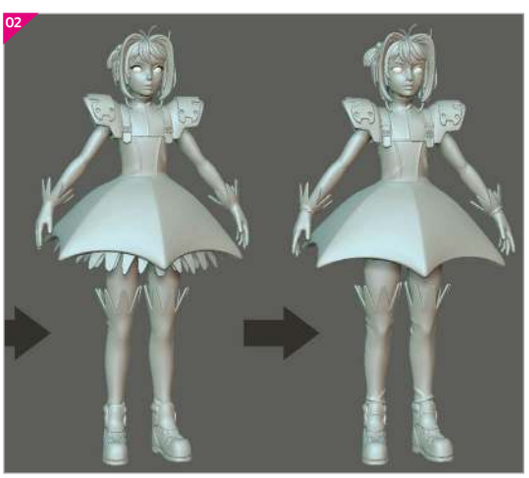
In this tutorial you will learn a streamlined, professional approach in completing a stylised character for next-gen video games. Developing a character for modern game systems is challenging, it takes a lot of patience and a level of expertise to complete.

This means that it is up to you as an artist to pick your battles and use your knowledge to find creative solutions when turning a 2D concept into a 3D character.

You will also learn about presenting your work for your portfolio to display it in the most appealing way possible.

01 Create a base mesh When creating a new character you should always start with a strong base. A base mesh, or proxy, is a low-poly, simple mesh that is built strictly with large rough shapes that represent the primary forms of the design. Avoid detailing and working with secondary forms at this stage.

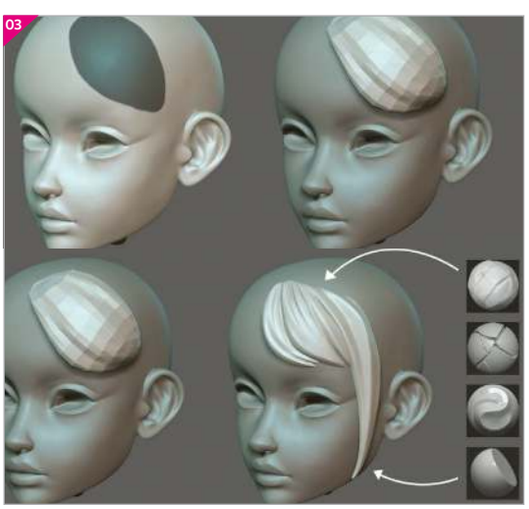
Focus on perfecting the silhouette and proportion of your design; it's much easier to work your way down into smaller shapes and details once you have perfected these forms. I recommend using multiple SubTools during this process to develop the different elements of the character in isolation (anatomy, clothing, hair).



02 Replace the base mesh Once you're happy with your blockout, it's time to start refining the shapes. Choosing to build on the face and anatomy first will allow the remaining elements of the character to easily slot into place. Study and consider the planes of the face and body when developing anatomical features.

Use lighting on your model to help indicate the main planar changes. You should also consider the same theory to the planes of metals and fabric.

For example, Sakura's metal components have strong, defined bevels to help push her design and give the light an interesting surface to bounce off.



03 Sculpt the hair When sculpting hair, keep it simple! Start by masking parts of the head and extracting the primary hair groups one by one.

Then run ZRemesher on each of the new extracted SubTools to generate clean low-poly geometry.

By doing this we will have greater control over the mesh and we can now easily deform its shape before we begin sculpting in any details. When you are sculpting strands try to keep most of the detail at the tips and the scalp. This means that you don't have noise, making your overall character look crowded.

Try to think about the flow of natural hair and reference how hair is drawn in illustrations and manga to help you achieve the look you need.

> Use lighting on your model to help indicate the main planar changes. You should also consider the same theory to the planes of metals and fabric

04 **Sculpt stylised cloth** Use a combination of ClayBuildup and Orb Crack brushes, and masking to push and pull shapes from your mesh to match your reference. Think about it as if you are drawing the garment in 2D; sketch your folds very roughly with ClayBuildup and masking, refine them with Orb Crack to sharpen your edges and establish cavities. The hPolish brush will help to refine the planar transitions in the cloth. Keep in mind how the type of fabric and construction will affect the physicality of your folds. A stiff textile with panelling won't have as high of a frequency as something puffy and light.

05 **Refine the details** Spend the time researching and understanding your style to get a strong idea of how small you should go with your details. For Sakura, the aim was to keep her very chunky and clear with enough high-level detail to give her a visual impact. In order to really push her design, more detailing and construction was added at this stage: screws, bolts, tighter bevels, panelling on the dress and pauldrons, then battle damage.

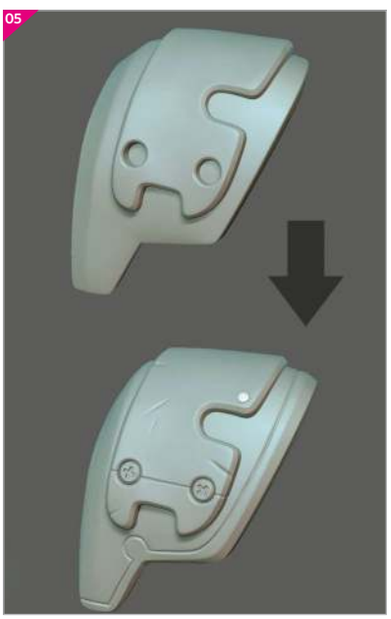
06 **Retopology** Retopologising is the process of generating low-poly geometry over the surface of your high poly sculpt in order to make it 'game ready'. We do this because modern game engines can't handle the density of a sculpted mesh. It also makes it difficult to animate and apply textures. When retopologising try to keep your geometry as low-poly as you can while also retaining you character's silhouette and form. It is important to remember to optimise your geometry for animation. In this example you can see how the topology of the face is important in assisting the animation.

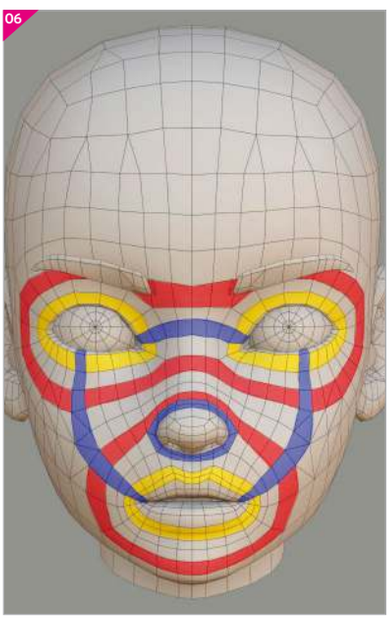
07 **Unwrap your mesh** UV mapping is the process of preparing your mesh to receive textures – this allows us to project 2D texture maps onto a 3D model's surface. When we create UV maps, we are taking our 3D model and projecting it onto a 2D plane, a bit like how a cereal box is printed flat then assembled afterwards. General advice when unwrapping is to keep the UVs as clean and free of deformation as possible. Hands and trousers are the hardest to unwrap; keeping them straight will make them easier to texture. A solid way of handling this issue is by cutting off the fingers, straightening the UVs out by hand and then stitching them back to the palm.

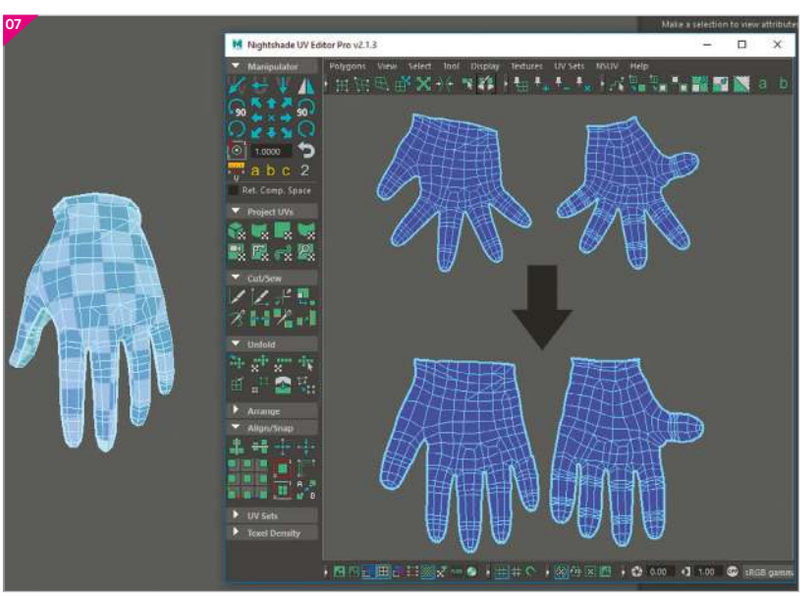
> "It is important to remember to optimise your geometry for animation"

Clothing construction

When creating stylised clothing it's always best to draw reference from real life and fashion. Stitching, hardware and panelling can affect a piece's overall composition, whereas tailoring clothing specifically toward your character's body type can really help sell a piece and reflect their personality. A shirt is never just a shirt, it can either be flattering or frumpy. It's all about applying and understanding these details that will really make a design shine.







> After blocking out the base materials start to add directional gradients to every element of your piece. Adding gradients helps guide the viewer's eye towards the face in a soft and natural way

Applying contact shadows and highlights to your texture

Treating stylised characters as if they were paintings will help ground them visually. A trick to help sell the physicality and construction of your design is by adding contact ambient occlusion. This is used by adding a slightly different hue/darker shade where two separate components meet.

This helps it look like two surfaces are touching rather than intersecting – small touches like these can really make a model look grounded. Adding further lighting information such as subtle highlights and tight shadows in cavities will push them out from the flat texture and further add depth to your piece.

08 **Apply base materials and colours** Your model is now prepped and ready for some colour! The quicker you get base materials and colours on your model the quicker you can visualise and make informed design decisions. Research the materials you want to convey and try out a few variations.

Using software such as Quixel Suite (which uses tileable scans to generate true PBR materials) will help streamline your texturing workflow. Try not to stick to these values and textures too closely, you should only be using them as a base when working on stylised characters or else you risk your character looking generated and plain. Spend the time testing out some alternatives.

09 **Gradients make everything better** After blocking out the base materials start to add directional gradients to every element of your piece. Adding gradients helps guide the viewer's eye towards the face in a soft and natural way. The general rule is to use a slightly different hue, darker in value and more saturated in colour. This adds a fresh feel to the colour instead of simply using a darker shade or multiplying blacks on top. For Sakura, a warm orange gradient was applied to the dress, a warm purple on her socks and a cool blonde shade for her hair.

10 **Material definition** Material definition is all about recreating real-world surfaces in a believable way so that they not only reflect that material to the viewer, but establish visual contrast between surfaces in your design. If you have lots of shiny surfaces close together, adding variation in the specular/roughness will help to separate the elements from each other. Think about it the same way as you would with value, you want variation and contrast in the right places to create visual interest in your materials.

11 Add spice to your textures Thinking of ways to tie your whole character together in its own reality helps to ground your design and make it look cohesive. We can achieve this by using repeating motifs across the texture, such as branding for technology and clothing. Sakura's outfit is made by her friend Tomoyo so it would make sense that her clothes should look like they were custom made for her and would have Tomoyo's signature brand. Her headphones, shoes, overshirt and socks all share the same motifs and colour schemes to help sell the narrative.

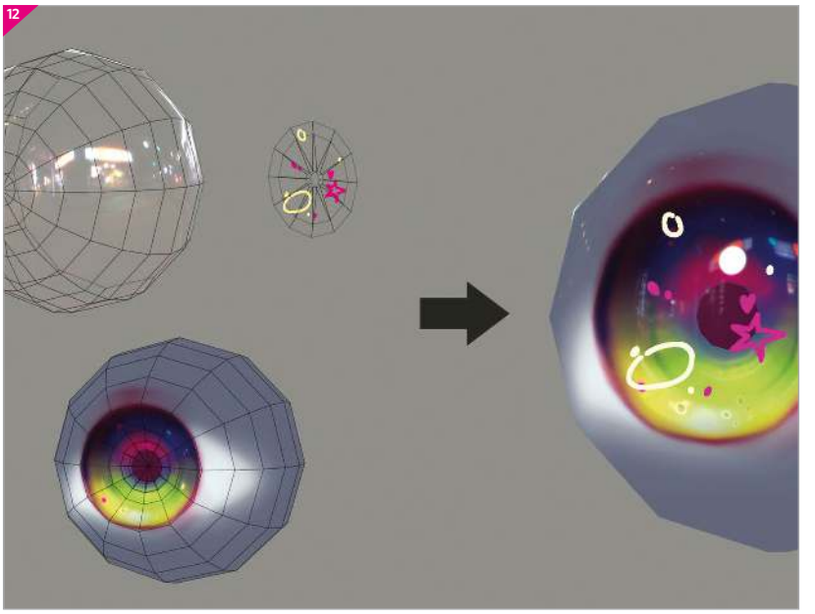
12 Experiment Make it a goal to learn something new with every personal project. For Sakura, the aim was to give her big sparkly anime eyes. The diffuse of the iris was painted in 3D-Coat, then bright white spots were added to the specular map to create sparkly glitter on the iris. By doing this it meant that her eyes sparkled when the light hit her eye. Small, layered alpha cards with an emissive texture were applied to create the glowing shapes on the eye. It is cheap and dirty but it's all about the result, don't be afraid to test things!

13 Feedback is important Regularly ask for feedback from your peers during the process of creating a character. Feedback keeps us, as creatives, on our toes. Gathering knowledge from others only makes us stronger, more capable artists. Don't be shy to post your work and get feedback from those around you. Just because you have retopologised and textured your character doesn't mean there aren't some edits you can still make to the sculpt and rebake onto the texture after.

Presentation tips

Catch the viewer's eye in a way that will keep them engaged. Accomplish this by making sure the beauty shot is the first thing they see. Then display your technical ability with some detailed breakdowns of your topology and textures. Try not to split this into lots of images as you don't want to oversaturate your viewers. Including a turntable GIF/Video or 3D viewer will help give possible employers and peers a way to view your model more closely.

12



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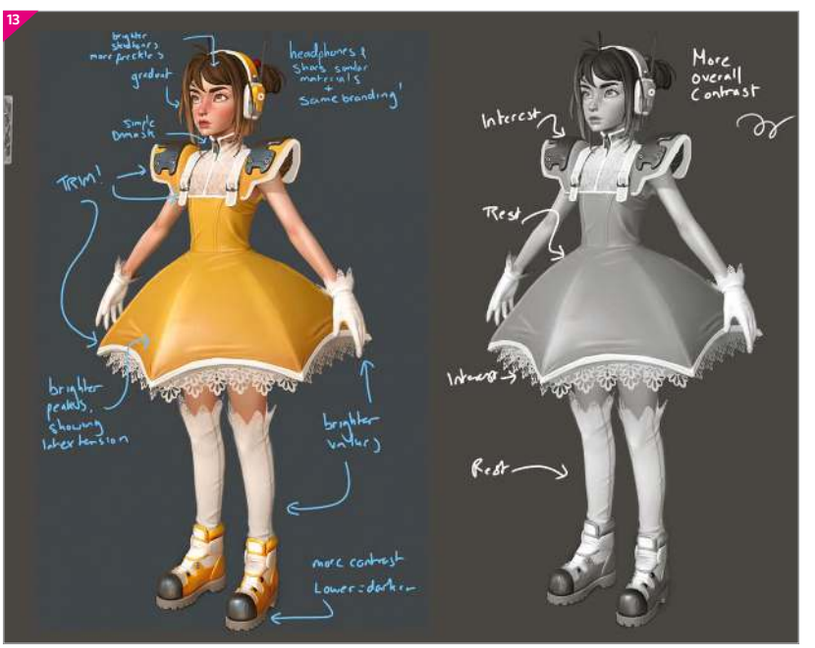
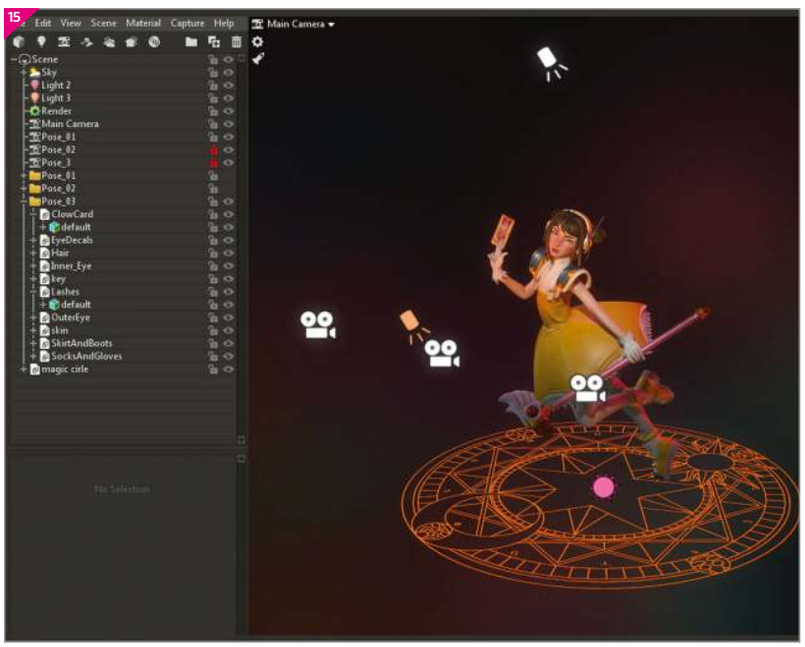


11

“Sakura’s outfit is made by her friend Tomoyo so it would make sense that her clothes should look like they were custom made for her and would have Tomoyo’s signature brand”

14 **Pose your character** Reference, reference, reference. Posing your character is one of the most important steps for any personal project. Research your character and their personality – what situations may they get into that you could capture in a still? Try to have at least three poses for every character: relaxed standing, an action pose and a beauty render pose that has a strong expression for close ups. Research poses online and try to replicate them. If you can't find anything you like then pose for yourself in the mirror. Spending the time checking their silhouette and creating dynamic angles throughout the body will make your character look engaging from various viewpoints.



15 **Presentation** Great artists steal. The same as you did with posing, research dramatic, clear ways of presenting your character to give them more impact. Consider how a photographer would frame and shoot their subject, what mood are they trying to convey, how are they using lighting to represent emotion and tone? Be careful not to make your renders too dark (you want people to see your work clearly) but also be wary of how bright lights can blow out your lighter values. Using cosplay photography as reference can be useful, whilst dramatic lights and FX are heavily used, the photographer is still able to keep the image as readable as possible.

Showcase

Shayleen Hulbert

Shayleen is a freelance character artist working in London and has over three years of experience in the games industry. She has worked on a range of projects from indie titles to AAA titles such as *Heroes Of The Storm* and *Spyro Reignited*.

***Guilly*, 2017**
ZBrush, Maya, 3D-Coat, Quixel Suite, Photoshop, Marmoset Toolbag
A collaboration real-time character with concept artist Mario Manzanares.

***Elphelt Valentine fanart*, 2016**
ZBrush, Maya, 3D-Coat, Quixel Suite, Photoshop, Marmoset Toolbag
A real-time character fan art recreation of the *Guilty Gear* character Elphelt Valentine.

***Genie Kid*, 2017**
ZBrush, Maya, 3D-Coat, Photoshop, Marmoset Toolbag
A real-time recreation of Baptiste Gaubert's Genie Kid concept for *Abraca*.

CRYSTAL BRETZ
S W I R L Y 3D, 2018

Bio

Crystal Bretz is a model/texture artist with just over three years of experience in the film industry and has worked on over 20 titles such as Marvel's *Black Panther* and *Fantastic Beasts: The Crimes Of Grindelwald.*

Software

ZBrush, Maya, XGen, Arnold

Learn how to

- Create a realistic groom with XGen
- Shade dyed hair with Arnold
- Art direct your hairstyle for presentation
- Utilise XGen clump modifiers for layering
- Create XGen guides from proxy geo

Concept

The concept used for the hair in this tutorial is called S W I R L Y by Angel Ganev.

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- Tutorial screenshots

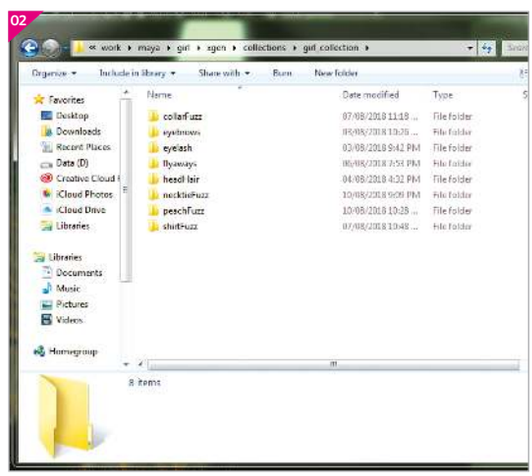
Create wind-swept hairstyles in Maya

Learn how to create realistic features on a stylised model and make interesting hairstyles in Maya using XGen, Arnold and ZBrush

The XGen hair system has been the top choice for many artists lately for creating hyper-realistic hairstyles. Like many grooming tools, XGen can be a bit of a challenge to learn, but once you get the hang of its great tools you can create beautiful hair with ease. In this tutorial you are going to learn how to create a wind-swept hairstyle using XGen, Maya, Arnold, and ZBrush.

This tutorial demonstrates how to create hair guides from proxy geo, simulate hair layering using XGen's clump modifier, and shade dyed and damaged hair in Arnold. You will also learn how to create stray and art-directed hairs for a final presentation of a still frame that simulates motion.

01 Create proxy hair geo Before starting any hairstyle it's good to block out a proxy geo. This can be beneficial for many reasons. In this particular case we're using it to establish the volume of hair and how far it should come off the head and we'll use it to create our guides from. This has been done in ZBrush with DynaMesh for this instance but can be done in any 3D modelling software that you're comfortable with. Once satisfied with the proxy geo, making sure it matches your concept, we'll ZRemesh and export the geo to bring it into Maya later.



02 Prep your scene for XGen Now that we have our proxy geo we can start to prep our Maya scene to start with the XGen. The first steps before starting the XGen is to triple-check that your project is set. This is super important so that you don't lose work and your XGen maps save to the proper folders once painted. The next step is to import a mid-resolution version of the character model you will be using for the hair. Make sure this geo has its UVs in UDIM 1001. This is important because XGen uses Ptex when painting maps.

03 Create hair cap geo The next step is to create cap geo out of the imported mid resolution mesh. To do this we will chop everything off the geo that we don't need hair on. You will create this geo to generate your XGen hair on instead of your clean model. We will make these cap geos invisible at render time or cast shadows so they don't exist to the camera by changing their render stats in the attribute editor. Alternatively, you can hide the cap geo completely when rendering, it doesn't need to be visible for the hair to show up.

> "The first steps before starting the XGen is to check that your project is set"

“The next step is to import a mid-resolution version of the character model you will be using for the hair”

04 **Create curves from proxy geo** Now we'll import the proxy geo we created in ZBrush earlier to create guides from. This is done by selecting the edges and converting them to curves. While doing this step it is important to keep in mind the direction in which your curve is going. The curve needs to start and be touching the base of the scalp or XGen will create a real mess when you generate the hair and potentially crash Maya.

The little square represents the start of the curve, you can reverse the direction of the curve in the Surfaces tab>Reverse Curve.

05 **Create XGen guides** We're going to create a new XGen collection and description with the following selected: Splines>Randomly Across Surface>Placing And Shaping Guides. Now that we have curves representing the general volume of the hair from the previous step we'll convert these to XGen guides.

We will do this by selecting our curves and navigating to the XGen Utilities and using the Curves to Guides option. After this we'll need to create more guides, as evenly spaced as possible, to fill in the rest of the head.

06 **Paint density mask** The next step will be to paint a Ptex map to control where exactly we want the hair to grow and how much. The maps are painted inside Maya with the 3D painter tool. These will be painted in greyscale, white is more and black is less. You can also paint with grey tones to thin out particular areas. To start painting you will need to click the Paintbrush icon next to the Mask section under Generator Attributes, set your resolution and name it. Then to save your new painted maps, click the Save icon next to the Paintbrush.

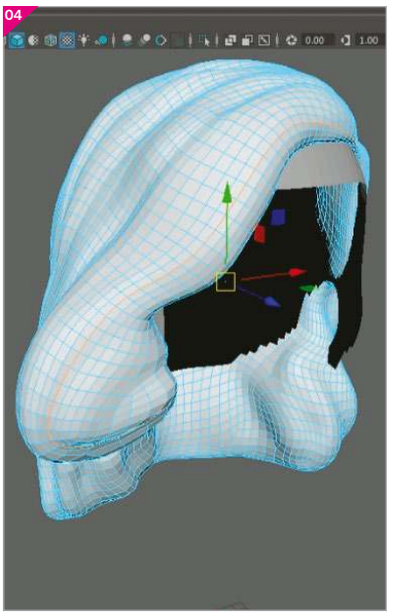
07 **Paint region map** Now we'll paint a region map to define where the hair will part. Without the region masks, XGen will not distribute the hair in a natural way. This map is also painted inside Maya, the same way as we painted the density mask. The difference between the two masks is that the region mask is painted in RGB colours instead of greyscale. You can find the region map under Region Control. If satisfied with your region mask, click the save icon. The region map won't work until you turn the region mask from 0.0 to 1.0.

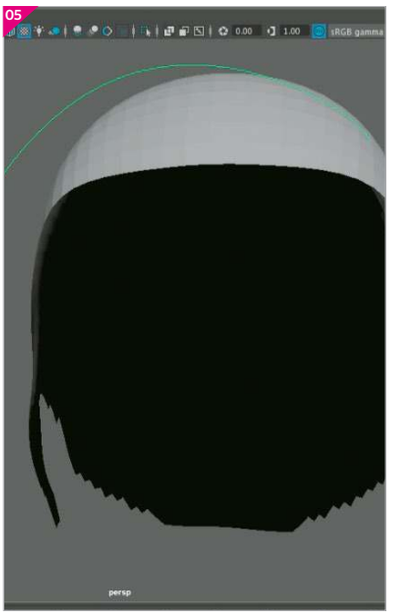
08 **Fine-tune hair** Next we're going to fine-tune our guides by grooming these as per our concept. At this time, we'll set the length for each guide, the width and taper of the strands, and adjust the density.

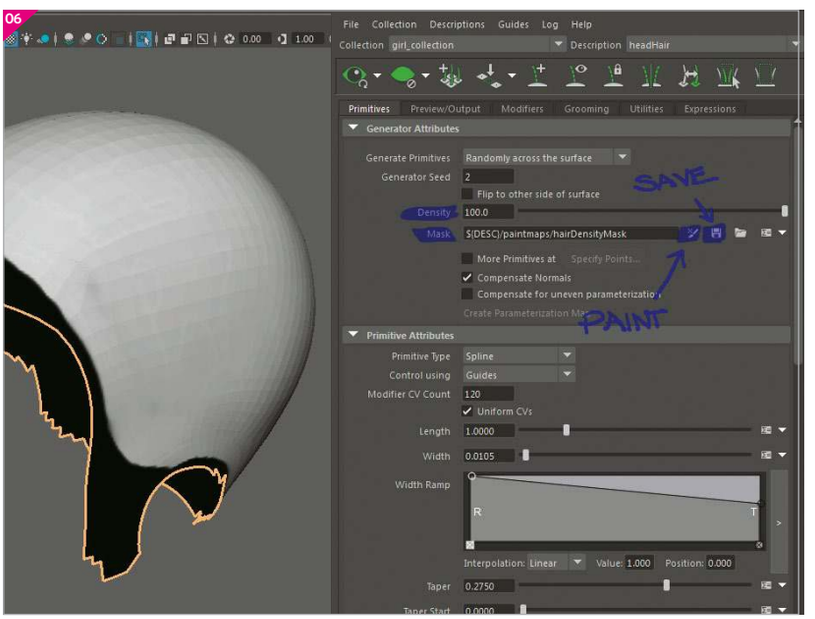
This particular project has a density of 100, and a width of 0.0105 with a taper of 0.2750.

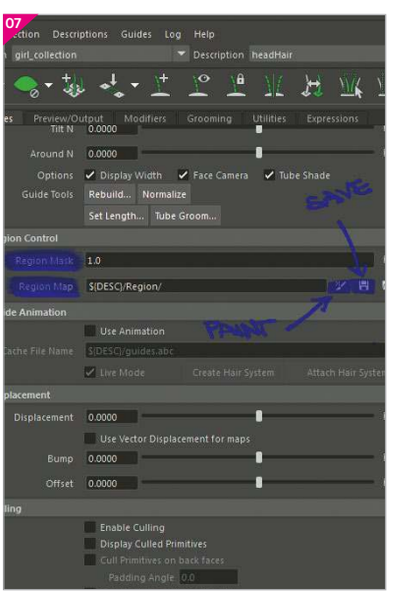
Why cap geo?

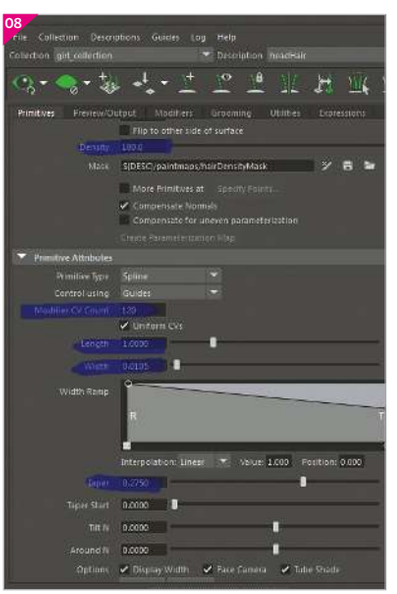
It is preferred to create cap geo when simulating the hair because it's easy to bind to the rig and deform, but in this case we use them as it helps to keep the hair away from the clean geo that you will render just in case you need to change or rename the geometry. Alternatively you can use your low-resolution character geo for the cap geo with a displacement map. This is not the only way to work with XGen but it provides peace of mind while working.

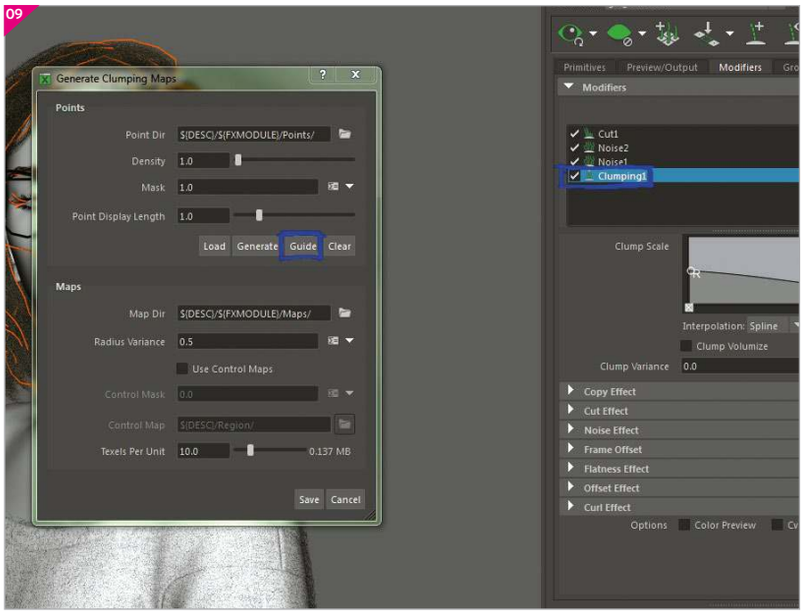


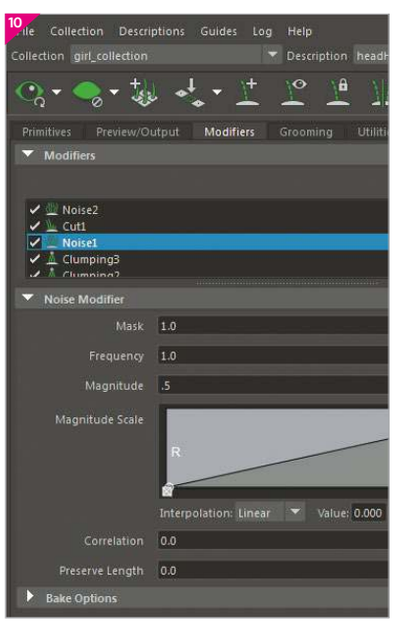


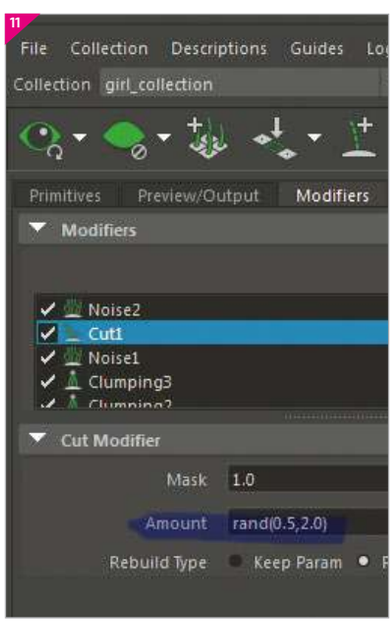


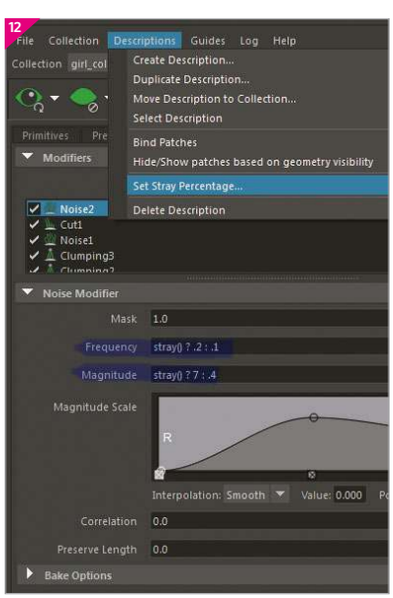


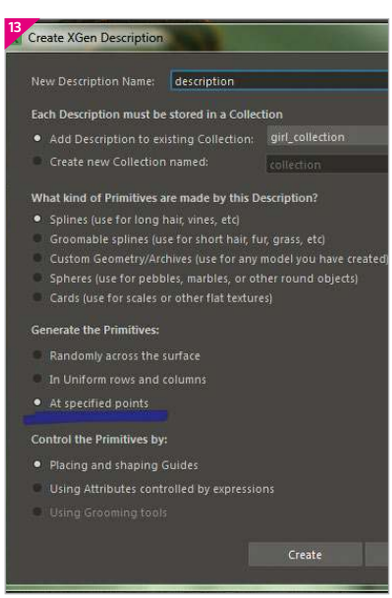












> “Adding noise to your hair can help add more realism to your groom by adding a notion of imperfection”

Using externally painted maps

Instead of painting inside of Maya there is another option to paint your maps in an external software, such as Mari, and import these into Maya to use as your maps. This is particularly useful when you're needing to use different paintbrushes to paint something specific for your hairstyle. You can do this by generating your Ptex map as mentioned in previous steps, then opening up your hypershade and viewing the file it creates and replacing the old Ptex with the new external map and clicking on the save icon to generate a new Ptex.

09 **Add layered clumping** This groom relies heavily on layered clumping with XGen's Clump Modifier to create a natural feeling to the hair. How we go about doing this is by having three Clump Modifiers stacked on top of each other. For the first, we will click Setup Maps and select the box guide and save. The next will be set up similarly except instead of using guides, set the Density to 0.5 and click Generate. The next setup is similar to the second, except set the density to an even higher value. You can preview each clumping layer easily with Color Preview.

10 **Add noise modifier** Adding noise to your hair can help add more realism to your groom by adding a notion of imperfection. This project has a noise with a frequency of 1.0 and magnitude of 0.5 added. You can layer noise as well depending on your hairstyle or groom but for this style it wasn't necessary.

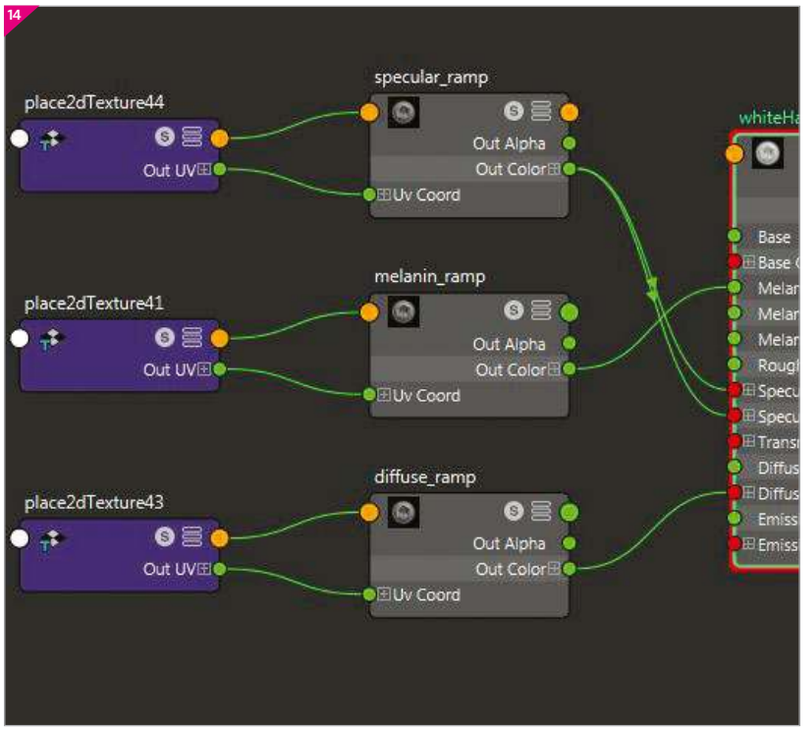
11 **Add cut modifier** Using the Cut Modifier will trim the ends of your hair by a certain length defined by you. This can be handy to create a natural look to the tips of the hair. This can be used to define split ends and hair breakage or even freshly trimmed hair.

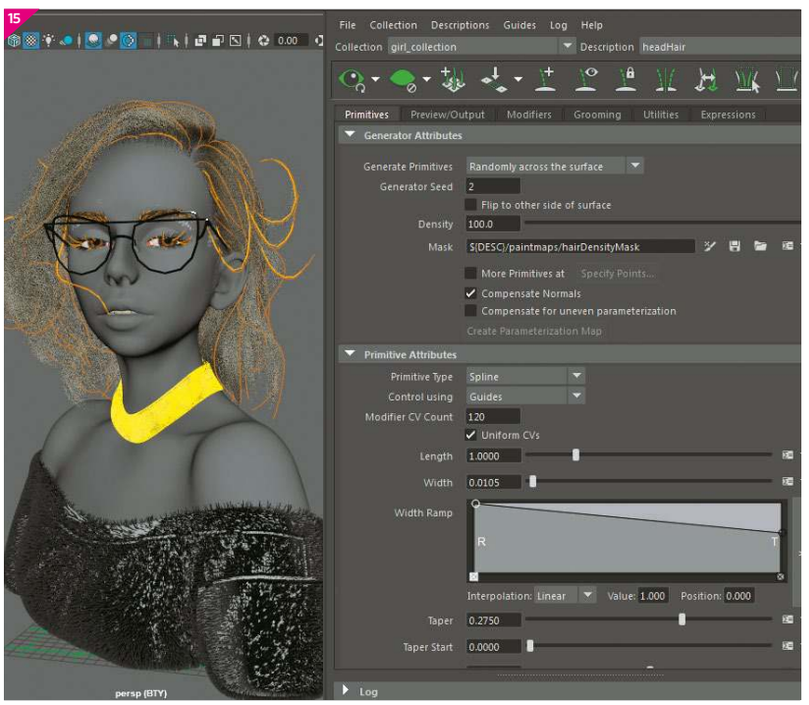
This hairstyle has one cut modifier added with an amount of: rand(0.5,2.0).

12 **Create stray hairs** Creating stray hairs is a very simple process with XGen but it's very effective for creating even more imperfection, thus adding more realism. To do this, navigate to the descriptions tab in the XGen editor, then click Set Stray Percentage. Set this value to 4. Now create a noise modifier and set the frequency to 'stray() ? .2 : .1' and the magnitude to 'stray() ? 7 : .4'. All of these numbers can be adjusted based on your specific hairstyle or groom but the expression will stay the same.

13 **Create flyaway/windswept hairs** This step is mainly for creating the art directed and windswept hairs seen in the concept. To do this we create a new description within the same collection using the options Splines>At Specific Points>Placing and Shaping Guides. Add a Clump Modifier and set up the maps to follow guides again.

14 Set up Arnold shaders for hair Now we will set up our Arnold shaders for the hair. To assign the shader, select the description group in the outliner and then assign the AI Standard Hair Shader in the Hypershade. After this is done, to create the dyed white hair and natural brown roots we will use ramps into the Melanin, Diffuse and Specular. Adding more melanin will make the hair darker so this is ramped to a 0.8 value. We want the white dyed hair to have more diffuse values so this is ramped to white. The specular was also tinted slightly browner near the roots.





15 Add final touches Now is a time you can look over your groom as a whole once it's rendered and make tweaks as necessary. You can increase your stray hair percentage and adjust your modifier values if they don't look right.

This is the time to make sure everything is working cohesively and adjust the elements that may be fighting each other.

Showcase

Crystal Bretz

Crystal Bretz is a well-seasoned model/texture artist with credits on more than 20 titles. While Crystal is currently working as a texture artist at Bron Studios, she is constantly working on developing her skillset in her free time.

***Hako: Beneath the Waves*, 2017**
ZBrush, Redshift, Maya, Mari, Substance Painter, NukeX
Hako was created in eight weeks during the ArtStation challenge Beneath the Waves.

***P-Body: Portal 2 Fanart*, 2018**
Maya, Mari, Substance Painter, V-Ray, NukeX
This is a fan art of P-body from the video game *Portal 2* that Crystal created as a hard-surface character project.

***Half-Billy: Wild West*, 2018**
Maya, ZBrush, Marvelous Designer, V-Ray, XGen, Mari, Substance Painter, NukeX
Half-Billy was created in eight weeks during the ArtStation challenge Wild West.

ArtStation Challenge – The Wild West

ArtStation Community Challenges were created to help artists improve their skill and compete in the spirit of community-based learning and to celebrate artists' achievements. To help artists push themselves, a talented team of professional artists are enlisted to work as Challenge Hosts providing regular feedback and sharing their production knowledge throughout each discipline. Challenges are divided into concept and production phases so that both 2D and 3D artists can participate.

Over 4,000 artists participated in the fifth ArtStation Community Challenge. This time, artists were challenged to imagine a world in the Old West. With a limited timeframe and a set amount of deliverables, artists are recommended to have a strategy in place to ensure that they can complete their submission on time. Check out these pieces of crucial advice from some of the artists that took part in the Challenges.

"I would say my biggest takeaway from the challenge would be to really push yourself. Take it as a chance to learn something new, push yourself outside your comfort zone. Meet new people and get to know them, and learn from their work! Most of all remember to have fun, because that is what the challenges are for. Do something you enjoy, and it will show in the final piece!"

Jared Chavez, 1st place winner, Game Character Art (Real-Time)

"The whole process could be divided into stages: 1) blocking; 2) clean-ish modelling; 3) UV unwrapping; 4) setting up the scene; 5) texturing; 6) compositing; 7) making test renders and receiving feedback; 8) repeating steps 4-6; 9) final submission."

Bohdan Lvov, 2nd place winner, Prop Art

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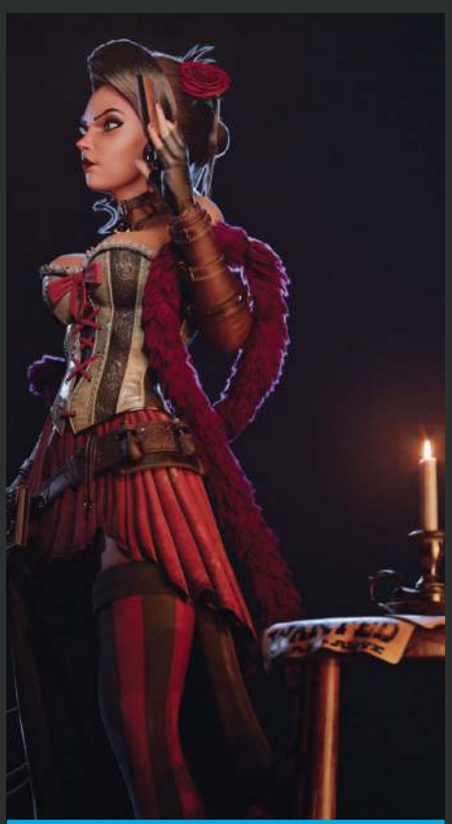


"My main goal was to improve my knowledge in sculpting something stylised with realistic material and learning how to present a character well. These are the two major things that I have learned and I feel much more confident that I will be able to handle something similar in future."

Aditya Chauhan, 2nd place winner, Film/VFX Character Art (Rendered)

TYLER BAY
tylerbay3d.com

Bio
Tyler Bay is a 3D artist who freelances and teaches online courses. Past projects include Pixar's *Coco* along with the Houdini For The New Artist courses at **cgcircuit.com**.

YOUR FREE DOWNLOADS
from **filesilo.co.uk/3dartist**
- Tutorial screenshots
- Houdini cheatsheet

HOUDINI, SUBSTANCE PAINTER

Essential Houdini tips for the new user

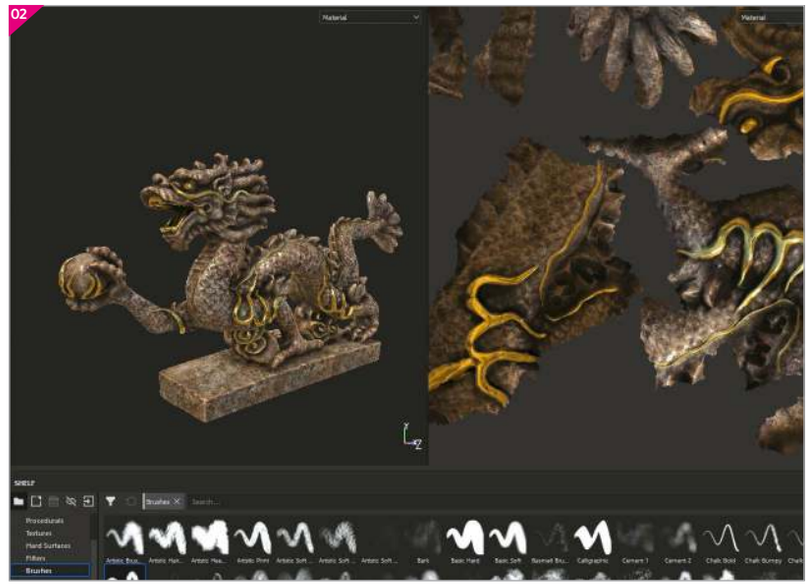
Houdini is one of the most impressive, well-built 3D applications on the market, and there's nothing else quite like it. When somebody mentions Houdini the first thing that might come to mind is incredible VFX! Procedural workflows!

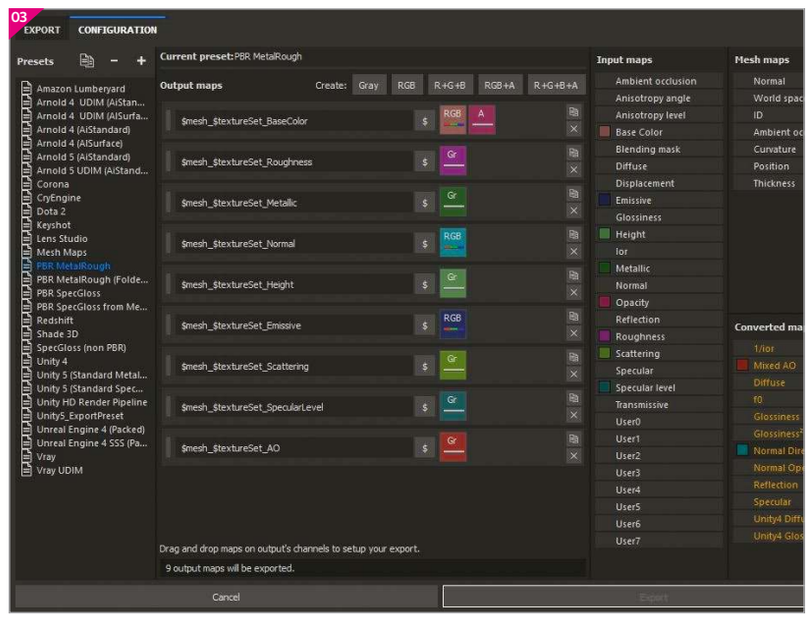
And... it's also perhaps an application that's super-intimidating and almost impossible to learn at first. For many people, Houdini looks like something that's a bit too out-of-reach or technical, but in my opinion, it's actually quite easy to use once you get past some of the basics. When I set out to create the Houdini For The New Artist course I wanted to make Houdini as friendly as possible to the artist, build something that looks awesome, and offer a way to eventually reach harder concepts with a foundation of skills and knowledge set in the right place. Let's take a quick look at how that can happen with this tutorial. The goal here is to create a transformation effect that turns a dark-marbled dragon into gold by using a combination of particles and custom shaders.

Also, as a side note, be sure to check out the FileSilo as you'll find extra resources, such as a Houdini cheatsheet, designed specifically with the new user in mind.

01 **Prepare the scanned model** The first step in this process is to prepare the dragon model. When working with scanned models, it's important to reduce the poly-count so that our scene doesn't get too slow. To do this, we can use the Poly-Reduce node and set the target poly-count to 100,000. On top of that, we're also able to paint areas that will contain a higher concentration of those 100,000 along the face to preserve some of the important, fine details where it matters.

02 **Texture in Substance** Since the typology is dense and triangulated, the best way to apply UVs is by selecting miscellaneous sections of the mesh and unfolding them. In order to do this, you can either select the faces manually or use the Auto-UV node that can be found within the game-dev toolset. Next, go into Substance Painter, here I utilised Substance Source for the base marble material along with the gold and then I baked out all the usual signal maps like occlusion, edges and so on. After adding some dirt, oxidation and other details, I also made a mask that will be used to control where the particles will eventually spawn.





> This setup works well with Houdini's principled shader, and all the maps just get read directly into the material parameters

03 Apply the texture maps To bring all this back into Houdini, you can set the export style within substance to Metallic/Roughness along with switching the Normal map style to OpenGL. This setup works well with Houdini's principled shader, and all the maps just get read directly into the material parameters.

04 Set the key light Next is lighting! The first thing I start with is an overcast, blue-coloured HDR that's set to a low exposure. By doing this, my goal is to allow the light values to hover just above black. This adds detail to the shadowed areas and gives us a base to work off of. After that, I begin setting the key light.

When adding this, I try to imagine what the light is doing to the personality of the face. I could make the dragon feel heroic or menacing just by the angle, so I went for a heroic feel by setting it to the top-left position.

Parameter setting tip!

The principled shader in Houdini is pretty convenient because it already contains fields that allow you to browse for the texture files right away. However, one thing you need to do is set the parameter you're reading in to 1. For example, if I read a roughness map, the 'roughness' value on the shader will multiply against the texture map values, and on the shader, you'll need this to be 1. This also provides a convenient way to multiply the texture map values if you need to.

DOPS? POPS? SOPS? VOPS?

If you've ever heard folks talking about Houdini, you may have already run into these terms before. Besides being great for catchy rhymes, these terms also refer to contexts within Houdini. DOPs – Dynamic Operators – refer to the place in Houdini where you'll have access to all the nodes that are responsible for building simulations. SOPs – Surface Operators – refer to the nodes you can find when working with geometry. Same thing with POPs – Particle Operators – and VOPs – Vex Operators.

05 Add rims, fills and 'skimmers' Once the key light is in place, I move on by adding other sorts of light such as rim lights, fills and something I like to call 'skimmers'. Rims help define the silhouette. Fills help in recovering form that gets lost in dark areas and 'skimmers' skim the surface to pick up the small details that can be found along the surface.

06 Apply interesting forces On top of this, extra forces get added to the Solver to help control the general behaviour along with adding break-up and variation.

For this, I added a Wind Force to help give a wavy behaviour along with some noise that pushed these particles in various directions.

07 Using noise to mask gold Once the DOP network is set up, the next step is to create a custom shader that will blend between the dark marble and gold materials. To do this, first create the two principled materials independently from each other. After this, you can simply blend the two by using a Layer Mix node.

To make this work though, the Layer Mix needs a way to read the surface of the geometry and either say 'yes, this is gold' or 'no, this is not gold'. We can tell the Layer Mix this information by using attributes.

08 Use attributes for more control An attribute is basically like a piece of information that gets attached to our geometry, and in Houdini, setting and creating your own custom attributes is really easy. For this gold effect, I used a noise to assign a Yes value of 1 or a No value of 0 along the surface of the geometry. As the noise animates over time, so too does the location of the gold vs marble, and I can plug in all that information with a custom attribute into the Layer Mix node in order to make everything work. I also used this attribute to prevent particles from spawning wherever there was gold.

> "To do this, first create the two principled materials independently from each other. After this, you can simply blend the two by using a Layer Mix node. To make this work though, the Layer Mix needs a way to read the surface of the geometry and either say 'yes, this is gold' or 'no, this is not gold'"

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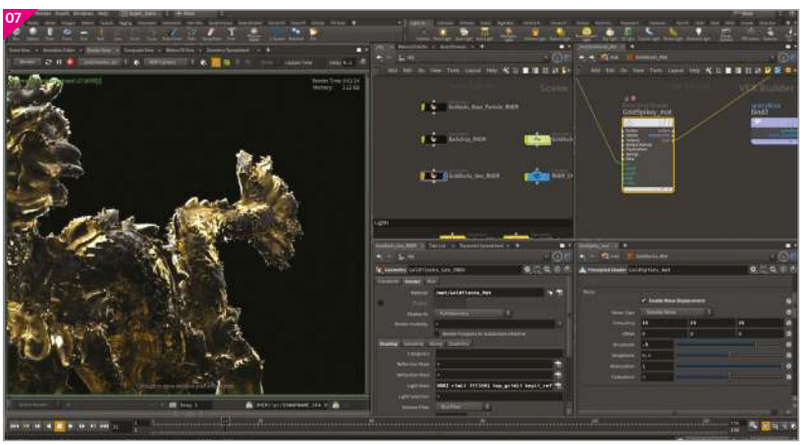

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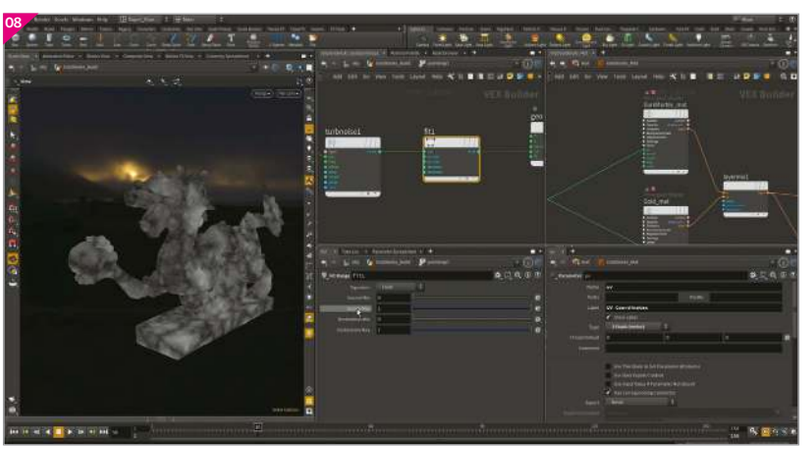

09 Separate elements for rendering For rendering, I separated out each part of our scene – the dragon, backdrop, particles and even the light that gets generated from the particles, into separate renders.

The idea behind this is to optimise render settings for each element individually and then eventually bring them back together in comp.

10 De-grain specific passes Another cool thing you can do with Houdini besides separating out scene elements, is adding render passes.

During comp, we can use these extra render passes to re-build the final image, and along the way, de-grain specific passes that appear too noisy. The cool thing about applying the de-grain effect to specific passes is that this also minimises the negative impact of the de-grain operation. The end result looks much cleaner this way.

11 Composite the final adjustments Last, but not least, all the final compositing adjustments are made. I can control the intensity of the lights even after things have been rendered, add a little bit of glow to the particles, and also fix any areas along the highlights that may have been getting too bright. The end result is what you see here!

What's 'Noise'?

'Noise' in 3D refers to a way of generating values using a mathematical algorithm. Rather than using, let's say, a texture map along with UVs to apply values across the surface of the mesh, noise can generate these values and assign them to an attribute. Normally, you might use noise to help in texturing something... but in this case, we can assign this value to something besides the colour – aka the custom attribute that controls the black marble vs gold – and that's how we can make it all work!

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Bio
Originally from Cuenca, Ecuador, Amaru is a senior 3D artist based in Seattle, Washington. Currently he works at Amazon Game Studios as a senior 3D artist.

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SUBSTANCE PAINTER

Photorealistic tyres in Substance Painter

When it comes to the creation of textures for CG assets there are different ways to achieve the results. After three years of using Substance Painter I believe that Allegorithmic is changing the CG industry in videogames, movies and commercials by providing amazing tools to create PBR nondestructive textures very quickly. Allegorithmic's Substance Painter, Substance Designer and Substance B2M are powerful tools. Each one gives you different approaches on creating textures but they can also connect to each other. Substance Painter is a great tool that allows you to import your 3D object and paint textures in real-time.

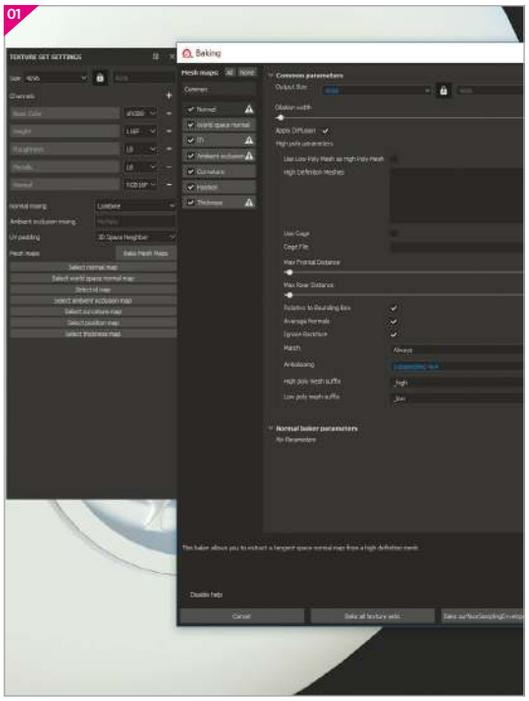
As mentioned, Painter allows you to work on a nondestructive workflow, which will drastically help you when you want to make fast changes.

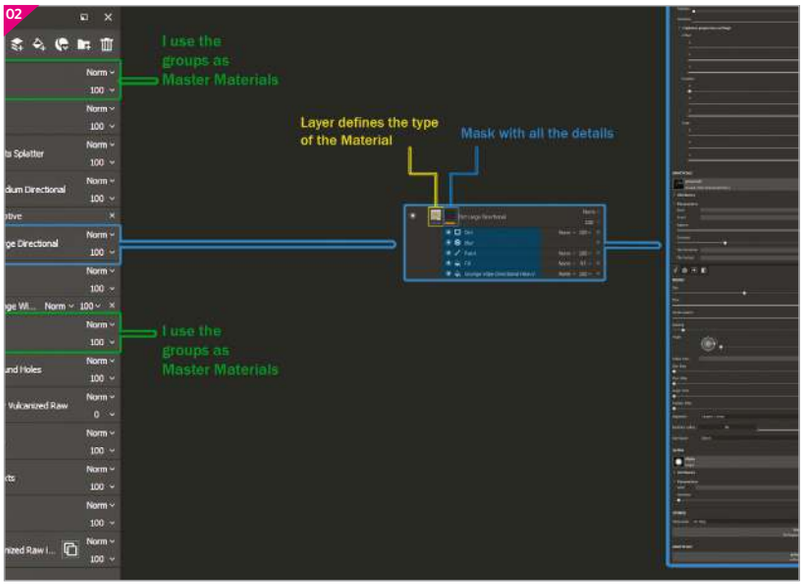
I still remember my first project using Substance Painter really well. It was fan art of the most recent *Mad Max* movie. Before using Substance Painter, I pretty much created all my textures using photographs and painted them in Photoshop. Well, that was a laborious, painful process. Just before working on my *Mad Max* project, I did some research on new tools to help me create textures more quickly. I found a few options, but when I saw some YouTube videos on Substance Painter, I couldn't believe how easy it was to learn the basics! Since then I've never stopped using it. In this tutorial I would like to share most of my tips and tricks to create photorealistic textures for race car tyres to use them in either a CG renderer like Arnold or in a real-time renderer like Unreal Engine.

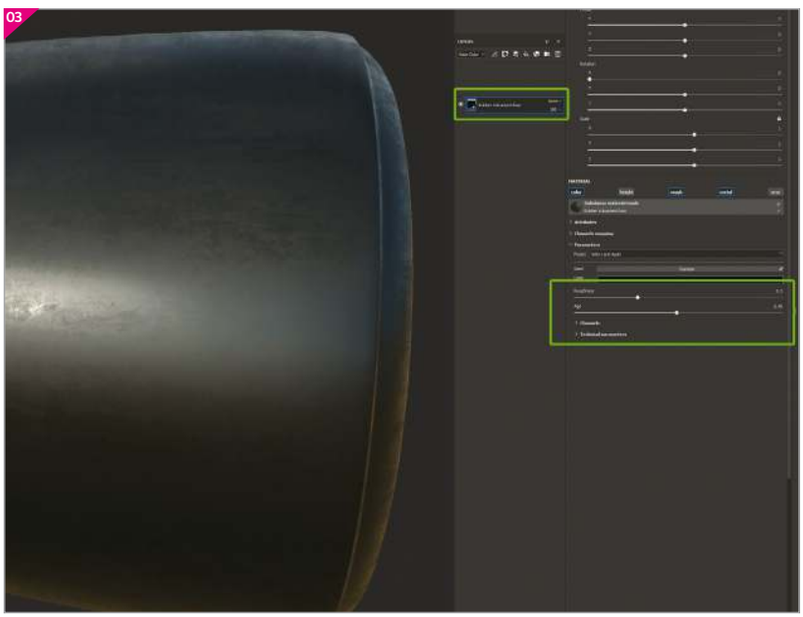
01 **New file and baking textures** There are two different types of workflow; Metallic Roughness and Specular Glossiness. We will be using the Metal Roughness workflow. Choose your project texture resolution (you can change it at any time), select your object and workflow, and create the new project.

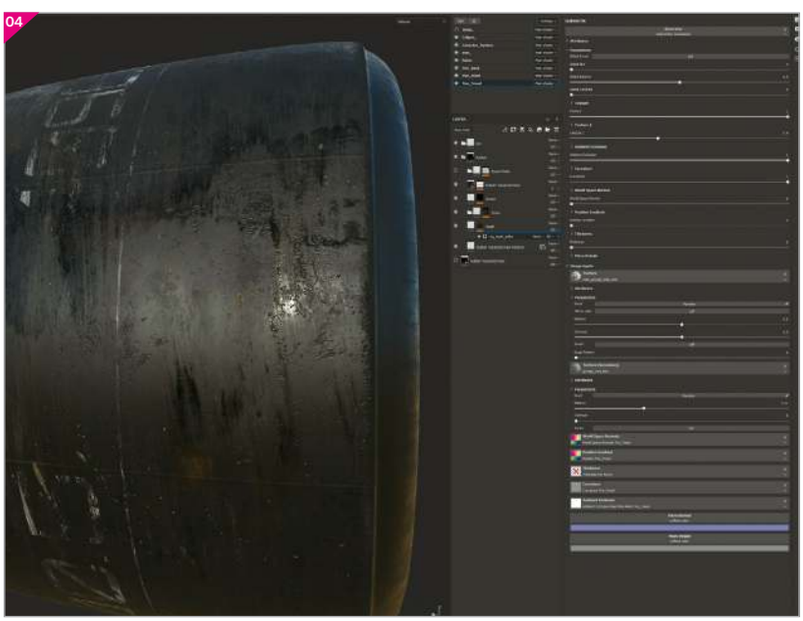
It is very important to bake our textures. In the Texture Set settings, we want to click on Bake Mesh Maps. Here you can choose any maps you might use. Remember you can always go back and re-bake or bake missing maps. I tend to bake in 4K resolution and with at least 2x2 Antialiasing for smoother curvature maps.

02 **Work nondestructively** I try to work procedurally as much as I can so I can adjust the look of my materials quickly without destroying my work.









> “You can also use these materials as a base and then start working on top of them to make the materials unique. In this case I have used the material called Rubber Vulcanized Raw”

Substance Painter has Regular layers and Fill layers. I use Fill layers as an actual material. I love working with fill layers because they can be modified at any time.

To keep things nondestructive, I usually use masks and leave the layers alone. The usage of Groups is key to making master materials and keeping thing organised. It is important to name and be specific as much as possible.

03 Base rubber texture Allegorithmic offers Substance Source, which is a PBR material library with tons of resources. You can access it by either clicking on the icon on the right tab or just simply by going to the web: source.allegorithmic.com/assets.

However, I try to create most of my materials from scratch as much as I can, it helps to achieve more unique features and gives more control. You can also use these materials as a base and then start working on top of them to make the materials unique. In this case I have used the material called Rubber Vulcanized Raw as my base rubber. This material gives you a perfect start.

04 Real-world details The more references you gather, the more convincing the textures you create will look. I always try to find references in different types of lighting since I like to see how materials interact in the real world. It is very important to pay attention to texture scale. Many artists make mistakes with just adding details with the wrong scale, this will make your texture not look believable. Sometimes small details are better even if you think they won’t be seen by the viewer.

> I have seen artists add many details to their textures but sometimes they just look lifeless. For a tyre I add some directional dirt on the tread just to make it look that there has been motion

05 Add age to the rubber As I mentioned before I like to leave my base material as simple as possible so then I can start adding more details.

If you use the Metallic Roughness workflow you know that the roughness textures will determinate the look and feel of your material. I like to add two or three layers to add extra roughness. For this I just create the layer and leave only the roughness channel, then I create a mask and I can apply a Fill. In the Fill slot I usually use the procedural textures in the Substance Painter library.

06 Add motion to the textures It is good practice to add motion to the textures. In real life nothing is static. I have seen artists add many details to their textures but sometimes they just don't make sense or look lifeless. For a race tyre I like to add some directional dirt on the tread just to make it look that there has been motion.

For this I create a new layer and this time I use all channels. Also, I like to add a texture into the Colour channel and lower the Intensity as this helps to bring a bit of dirt variation. Then I create a mask where I add a Fill. Here I can add the directional look I want.

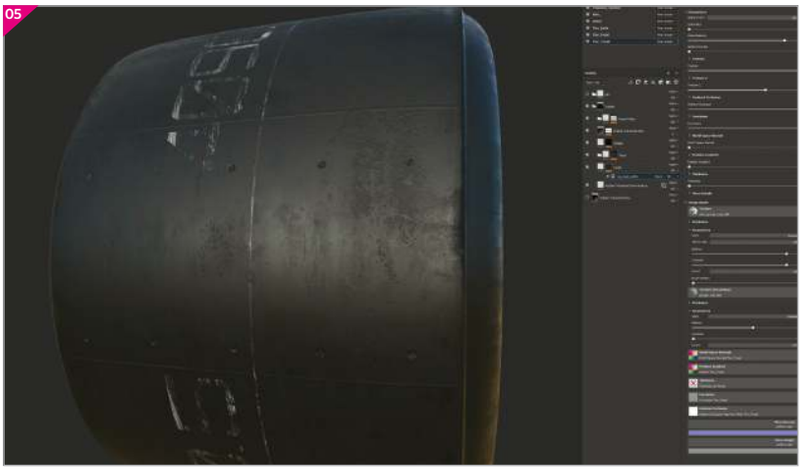
07 Add dust and extra dirt Sometimes we forget to use the map textures we baked at the beginning. Often I use the Curvature map to add details on the edges and the occlusion map to add some dust and dirt. To do this just create a new layer, keep Colour, Roughness and Metallic maps and make a very opaque material. There are two options. You can either just add a Fill and then add your AO baked map or just make it more complex.

08 Instance Layers The usage of Instance layers is great when you have multiple objects in different layer sets and you want to share the same material, because when you make a change it will affect all the layers that have the Instance. I used Instancing with the base rubber material so I can have the same clean look for all three parts of the tyre and then just add the wear separately. To do so just right-click on the layer or folder then go to the Instance layer and then select the texture sets you want to apply it to.

09 Paint the details I like to paint details after I am done with the procedural. Sometimes small details can add more realism. In this case I decided to add some chalk marks. For this I start with creating a Fill layer and lowering the Roughness. Then I create a mask on that layer where I add a Paint filter so I don't affect the layer, this way I can change the colour at any time.

There are many brushes in Substance Painter and I ended up using the Chalk brush. To create the Normal map for the big logo on the tyres I do the same approach, create a fill layer, only this time I leave only the Height channel with some value, then create a mask and finally add a Fill on the mask to add my Logo Alpha texture.

05



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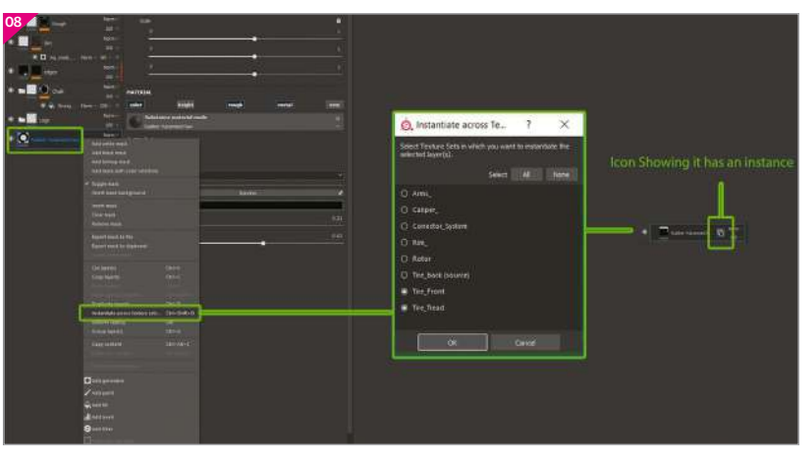


09

Technique focus

Incredible 3D artists take us behind their artwork

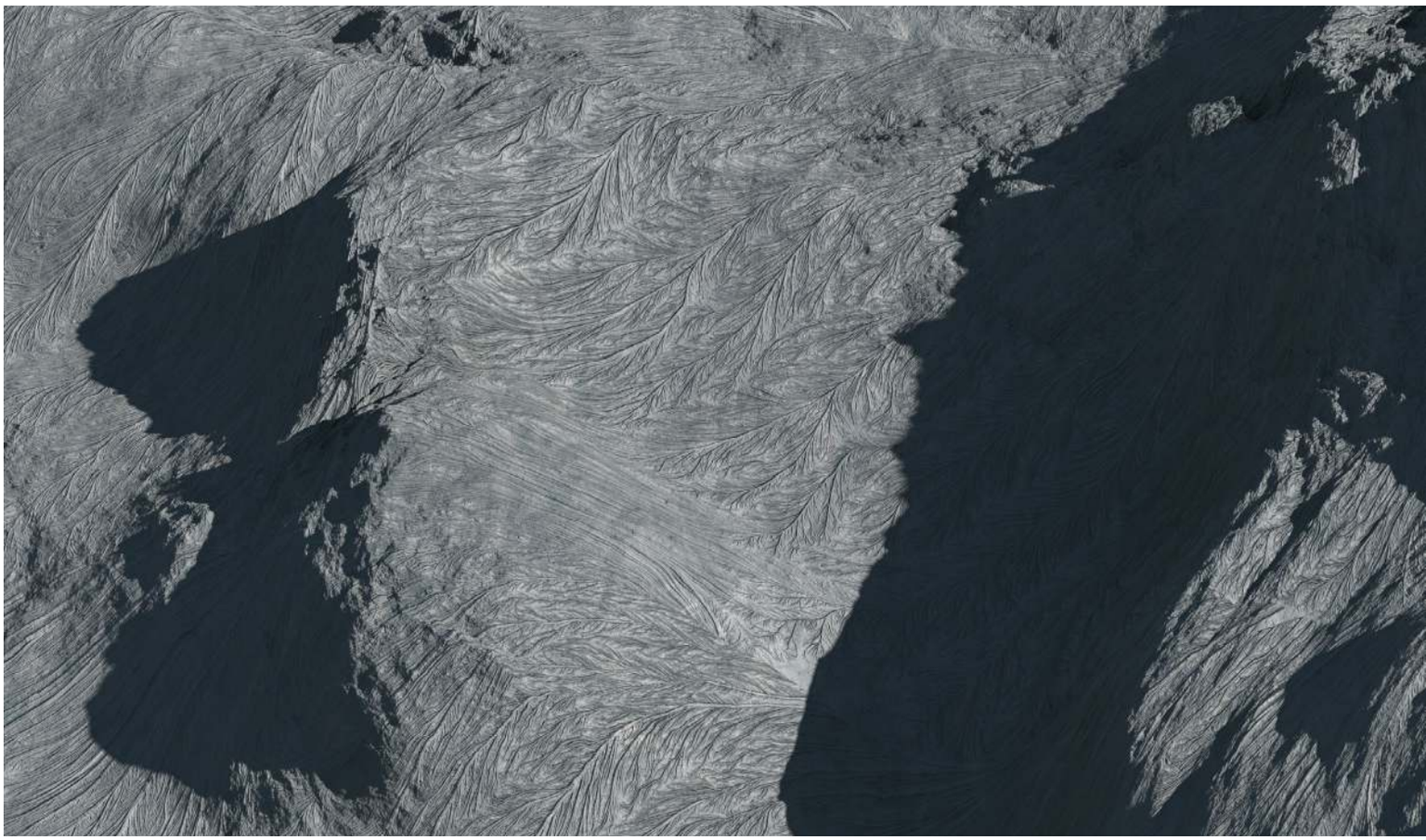
TEXTURING Utilising Substance Designer's purely procedural texturing workflow and after several weeks of rigorous research and brain-bleeding analysis, this dead coral material came to life. The trickiest part about this texture is how the inner shapes are blended together with the outer outline, while keeping both consistent in detail.

Reynante Martinez
reynantemartinez.com

A CG artist with passion for photography, composition, and lighting. Also an aspiring musician and a father to a lovely daughter.

Software Substance Designer

Dead Coral Material Study, 2018



JESUS SUAREZ
jesussuarez.tv

Bio
Jesus is a senior motion designer & 3D generalist currently based in Florida. He creates all types of content from hyper-realistic renders to stylised animations.

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- Video tutorial
- Cinema 4D files
- Tutorial screenshots

CINEMA 4D, OCTANE RENDER

Render realistic alien terrains with Octane

In this tutorial we will learn how to create realistic desolate and almost alien-looking terrains in Cinema 4D and Octane Render. I will show you some tips and tricks to create your own custom-looking mountains using the displacement deformer generated directly in Cinema 4D as well as using textures you can purchase online to add more realistic detail. I recommend sources like **textures.com**, **poliigon.com** or my personal favourite **tfmstyle.com**.

First we will explore how to generate our custom texture for displacing our base for the mountains in C4D. Then we will go over how to export that texture and bring it back into Octane Render for displacement.

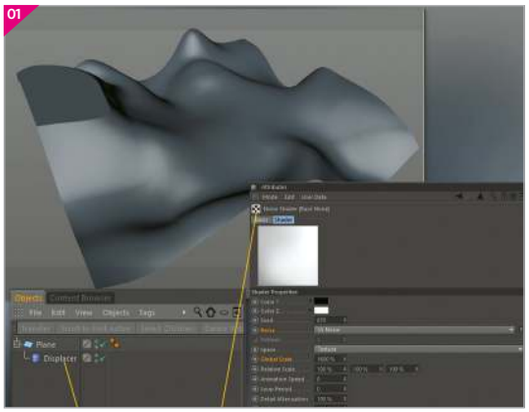
I'll show you how to add more detail by mixing images and using different nodes in Octane to make our terrains look more photorealistic. Keep an eye out for yellow highlighted text in the screenshots as those will be the properties I've edited. Keep in mind that exploration and trial and error are big parts of generating realistic-looking renders, therefore patience also plays a big part in this, so don't be afraid to try out different things and fail, you can always continue trying.

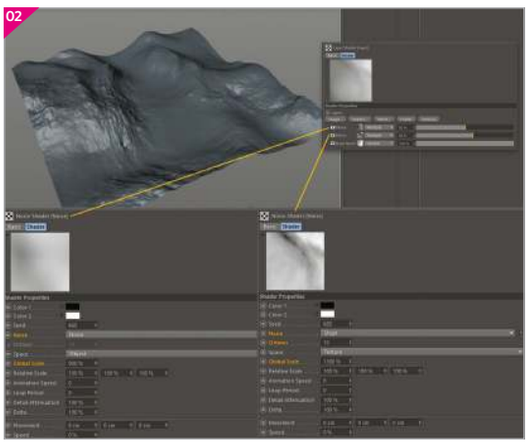
01 **Create the base** The first thing we need is a base for our terrain. For this we are going to grab a plane object and add a displacer as a child of the plane. In the Shading tab of the displacer click on the arrow and add a Noise. Play around with the settings until you come up with a good base for the overall shape of our terrain.

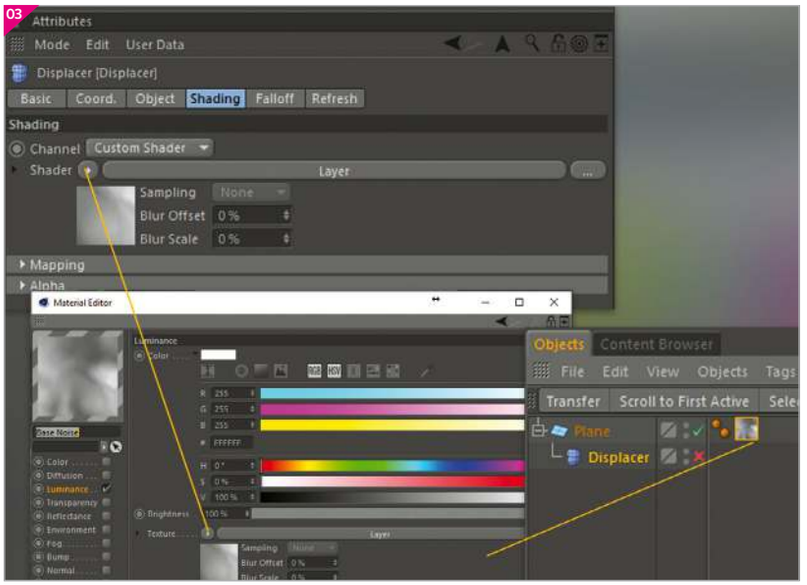
One thing to keep in mind is to make this Noise fairly large, mine is at 1600px. I've highlighted the properties I made changes to. Also, increase the subdivisions of the plane to get more definition.

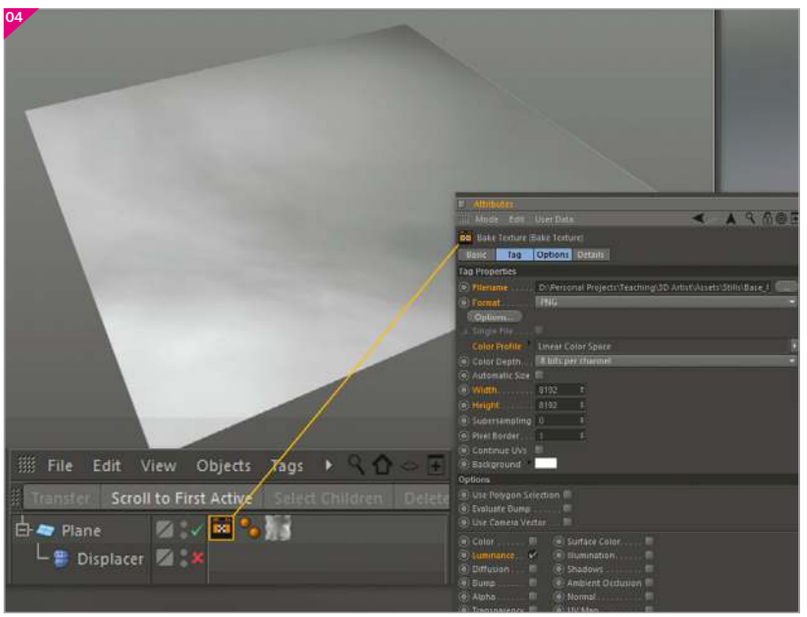
02 **Detail the base** Now that we have a good overall base we can add a little more detail. Go into your displacer object's Shading tab, click on the arrow and select Layer. This will keep your original noise and put it in a layer system where we can layer different noises.

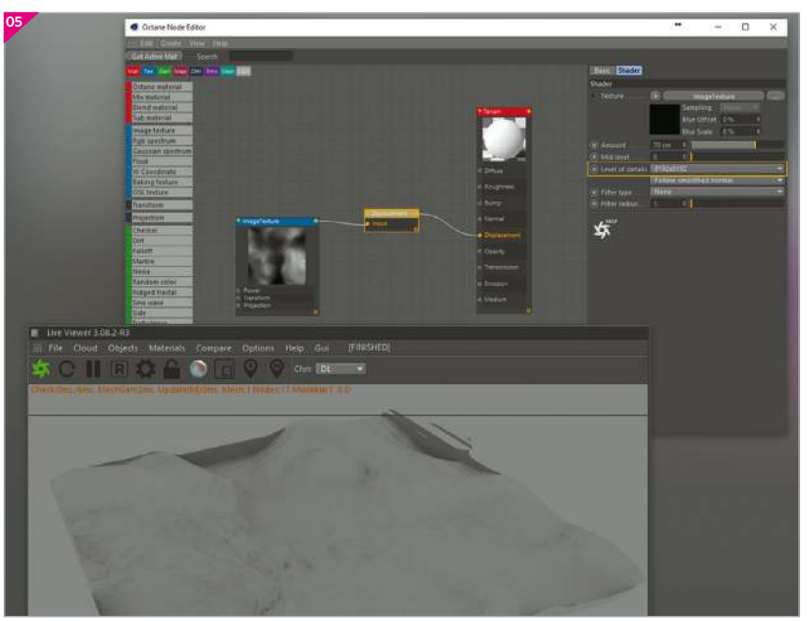
Add as many noises as you want and play with the blending modes and opacity. I used three different noises but one thing similar across all of them is the scale, they are all scaled up over 400%. My displacer is set to 100% Strength and 48cm of height as well.











03 Prepare a C4D material To be able to bake our texture we need a texture tag, so create a new material and apply it to the plane. In your displacer object's Shading tab click on the little arrow and select Copy Shader. In your new Material's Luminance Channel, click the arrow and select Paste Shader. Now our layered noises are on the material applied to the plane. At this point you can disable the displacer (we use it just to have visual feedback of our terrain), but keep it in case you want to update the noises and re-save the texture.

04 Save the texture Right-click on the plane and add a Bake Texture tag. Select a proper location for saving your file, PNG format, Linear Color space and 16-bit. This colour depth is very important to get more information in our greyscale image for Octane to displace. Make sure the texture is 8K in size (8192 x 8192) and select the Luminance Channel to export. Click on Bake. This process may take a few minutes depending on your computer's hardware, but trust me, it is worth the wait.

05 Octane displacement Now our texture is ready for Octane Render. Open the Node Editor, create a new diffuse Octane material, drag an Image Texture node and load our previously saved PNG. Drag a Displacement node into the Displacement Channel of the material and then connect the Image Texture node to the Displacement node's input. In the Displacement node select the appropriate level of detail for your image.

Apply the material to the plane, and reduce the subdivisions of the plane to 1 x 1 (for Octane, high subdivisions are not necessary for displacement). Fire up Octane and see the Displacement working!

06 Light the scene Lighting is very important to produce the results we want. Right now Octane's default environment is lighting the scene since there are no lights in it, which is why everything looks so flat. Add an Octane Daylight object and rotate it until you get some good shadows. Play with the Turbidity and Power as well. Also, add a Transform node to the Image Texture node and increase the size of the Texture to 1.1 to get rid of those artefacts on the edges of our plane.

07 Shade Terrains are not composed of just one colour, so we are going to mix two gradients that are slightly different but still very monotone. We can use a Mix Texture node to mix the two together and for the Amount we can use an Image Texture node. I am using Sand Ripples from **textures.com**, but you can use anything you want, a Gradient node is useful to increase the contrast of the image as well. Finally, plug the Mix Texture into the Diffuse Channel. We are starting to get the results we want!

08 Create bump detail We need more detail. First we are going to use the Bump Channel mixing three textures, two from the **tfmstyle.com** Retina's pack and an Octane Noise for the amount. Then we plug this mix into another mix and use another image with a gradient to increase the contrast a bit. We can just use a Float texture for the amount. Finally we just need to create a camera and change the focal length to something like 110, this will give us a more cinematic looking shot with less distortion.

09 Add a normal map Now we need more micro detail, and we can achieve this with a normal map. In this case I am using another texture from **textures.com** called Dusty Gravel. Plug it directly into the Normal Channel and add a transform and projection node to adjust the texture to your liking, let Octane render for a minute or two and you should see the difference, even if it's not apparent at first sight, the detail is there.

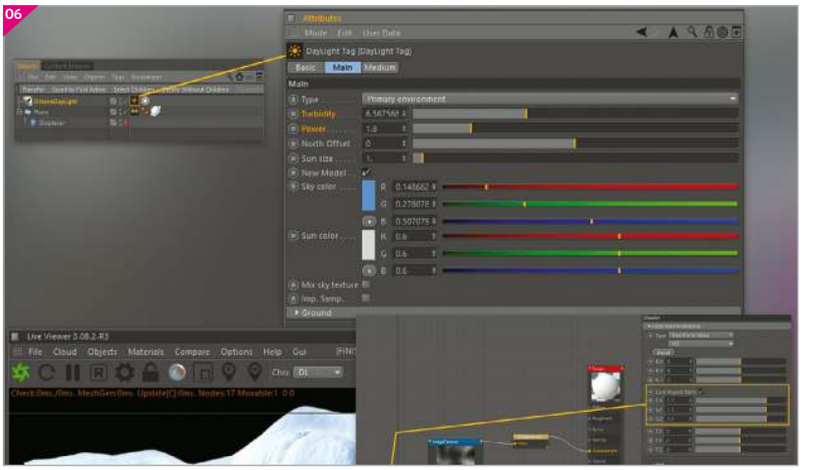
Adjust the Daylight system to art direct our shot a bit more and get the shadows you want and you are done!

> "We can use a Mix Texture node to mix the two together and for the Amount we can use an Image Texture node. I am using Sand Ripples from textures.com, but you can use anything you want"

Experiment, render, adjust, render

Cinema 4D offers great flexibility for experimentation, with layering noises. Experiment with different blending modes and opacities, layering different noises on top of each other and see how they interact together. A good tip is to hover your mouse over the Noise and use the scroll-wheel on your mouse to quickly flip through the different types of noises and see what they can do for your setup. Don't go overboard with the subdivisions on the plane, you only need a rough visual of how the displacement is going to look once displaced in Octane.

06



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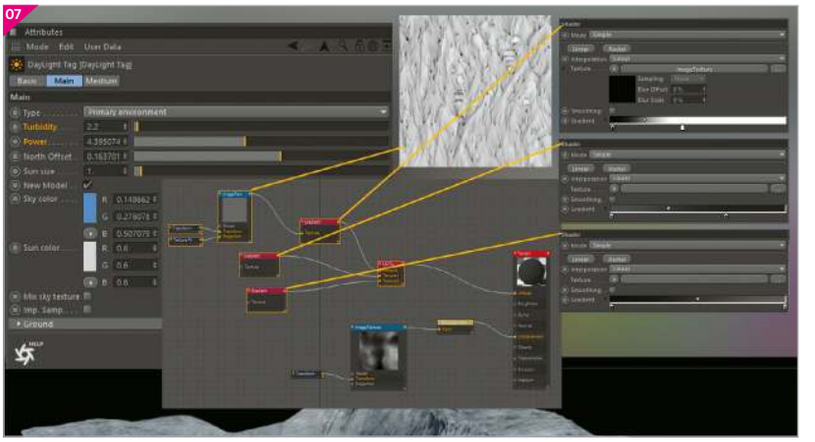

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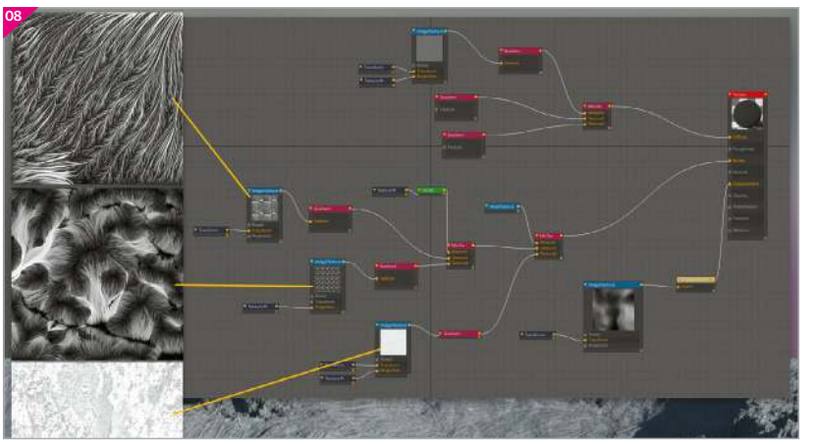

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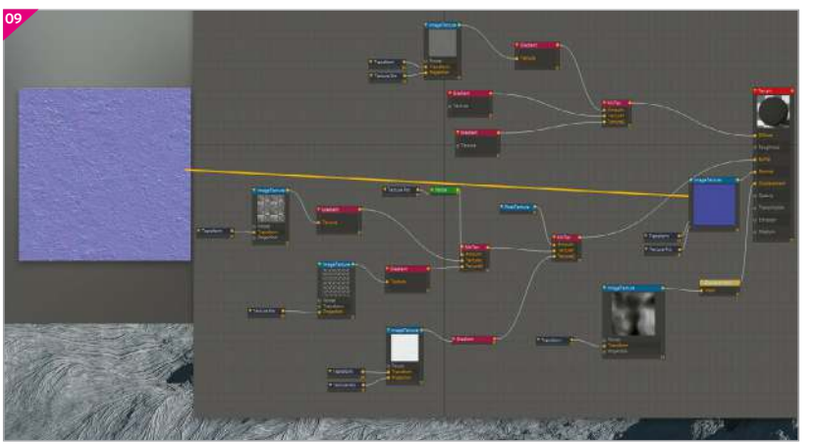

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Gravity Sketch 1.5

VR design with a robust feature set. But does it come at a cost?

Fairly or unfairly, to review Gravity Sketch is to review the current state of VR and some of the challenges this paradigm can bring. Thankfully, it hits more than it misses and provides arguably the most feature-complete VR 3D creative tool for serious concept and early-stage production work we've seen. We tested it on the HTC Vive.

The application – recently updated to version 1.5 – started in 2014 as one of the first touch-based 3D content creation tools on iOS and no doubt the experience of bringing complex tools to a simplified interface helped lay valuable groundwork as the company shifted focus towards VR.

Like traditional 3D software, Gravity Sketch benefits from reading its manual. Not to say it's not intuitive to jump in and start creating, but what initially appears familiar to anyone who's used 3D creation tools in VR belies a good deal of power under the hood that's not immediately apparent.

The major point of differentiation from other tools – and the true power of Gravity Sketch – is the editing power it provides. Once you've blocked in initial forms, everything you've placed is not just editable transformationally, but also parametrically. In addition to expected basic edits such as changing colour and material, control points can also be accessed, tweaked or even deleted to refine or dramatically alter forms after the fact. There's some familiarity here to anyone who's worked in a NURBS workflow.

Two of the standout tools here are Curved Surfaces (drawn in space with triggers pulled on both hands) and Revolve, a kind of digital lathe that allows you to quickly lay in circular forms from car tyres to wine glasses. In addition all the expected tools are there from line drawing (either free-form or point-to-point), dropping in primitives, and even pulling in poseable prefab forms or external meshes.

Gravity Sketch also supports grouping, layers, symmetry, reference images and a novel approach to optional grid snapping to help creators build some genuinely usable forms. Seemingly simple decisions like leaving up a visual 'ghost' of a mesh's prior position when you reposition it speak to many hours spent by the team on refining key interactions as does the pleasure of working with its VR keyboard – commonly a frustration in other apps. Finally, Gravity Sketch supports export to OBJ or Sketchfab, and FBX and IGES with a pro or studio licence.

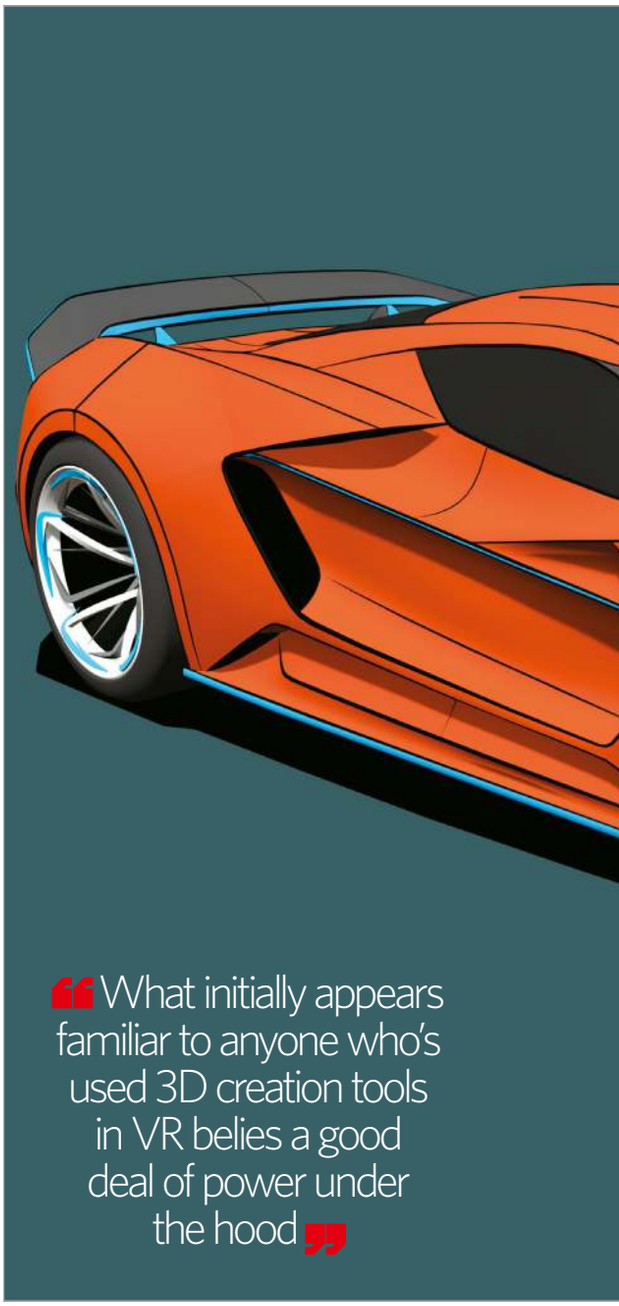
But there are annoyances. To start, the tiered pricing model isn't clearly defined.

While entering Edit mode is intuitive, changing colours or materials can be surprisingly frustrating as floating interface elements fight for visibility with the mesh you're actively editing. The 'turn back the clock' approach to Undo History using the thumb touchpad is novel, but sharing this button with the far more commonly accessed Tool menu is a misstep. And functionality not just based on trigger pulls but also partial pulls can require a deft touch.

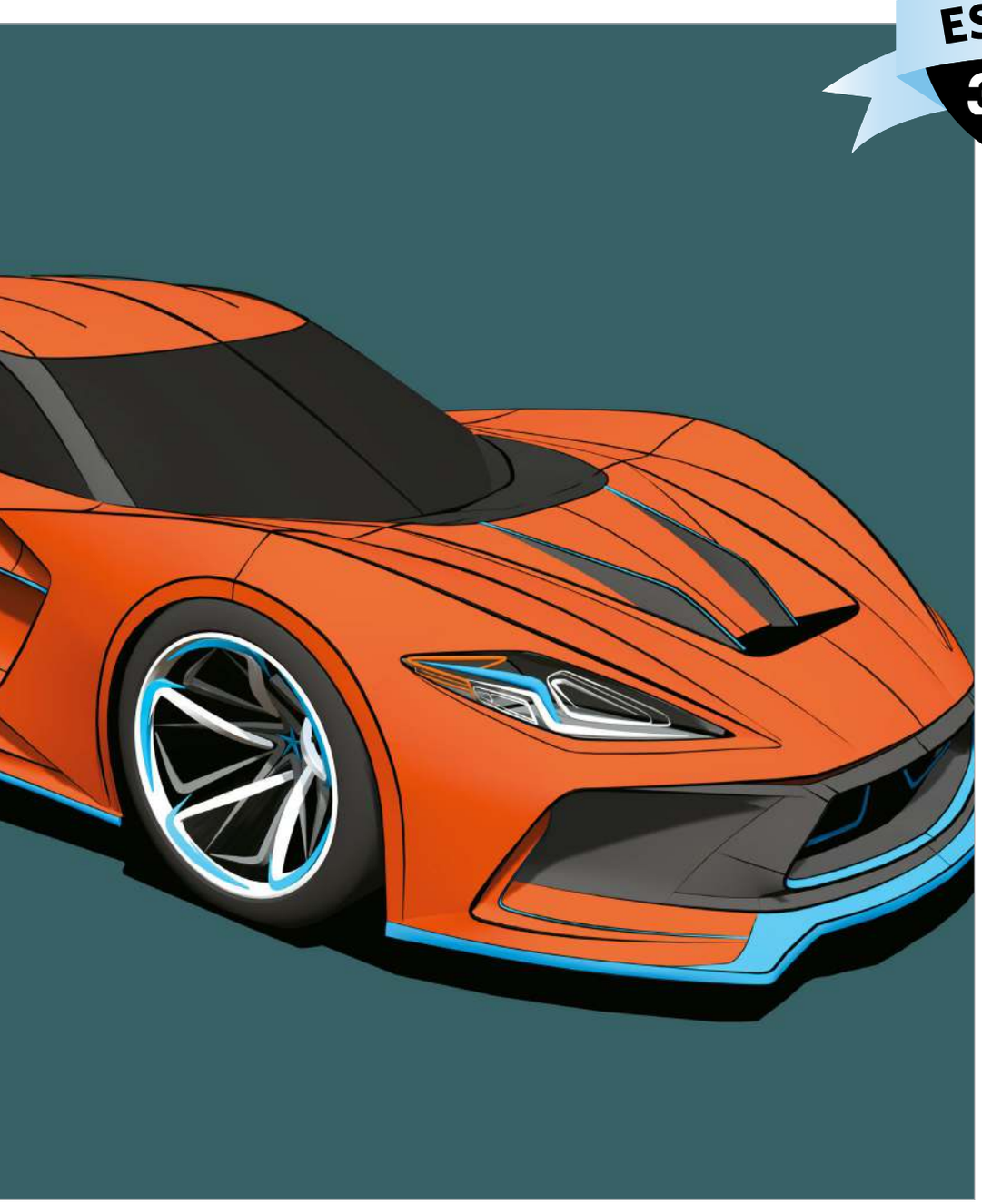
This brings us to our closing statement: while the team has done an admirable job bringing such a powerful toolset into VR, it does also come at the expense of using not just every controller button and trigger in some form, but in many cases, buttons and triggers performing double-duty. Are we starting to hit the limit of what current VR controllers can provide?

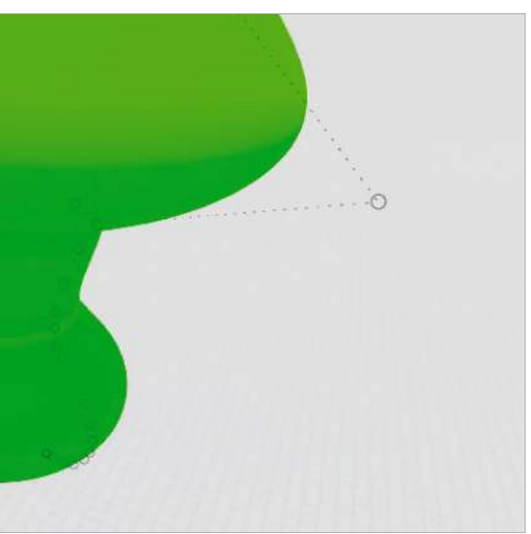
Quibbles aside, if you've been frustrated by the over-simplicity of VR creation tools, take a good look at Gravity Sketch. It provides some genuinely powerful tools and could well be what you've been looking for to lay in concept design and initial forms at a real-world scale in the early stages of your production pipeline.

Paul Chambers



> "What initially appears familiar to anyone who's used 3D creation tools in VR belies a good deal of power under the hood"





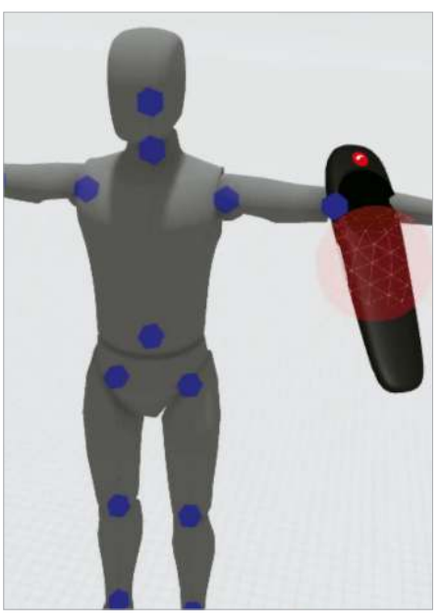
MAIN This race car design was made completely in VR using Gravity Sketch by senior designer James Robbins

BOTTOM LEFT The two-handed Curved Surfaces feature is one of Gravity Sketch's standout tools

BOTTOM MIDDLE After placing a form with the Revolve tool, parametric editing includes control point movement or deletion, thickness and profile

BOTTOM RIGHT The Undo History Rewind is a cool feature looking for a home, but unfortunately it gets in the way more often that it helps

BELOW Gravity Sketch even includes poseable mannequins, which is useful for showing real-world scale and ergonomics



Essential info

Price	From £22.99/$29.99
Website	gravitysketch.com
Available	via Steam Early Access
System	Windows 7 SPI, macOS High Sierra, and up
Supports	Vive, Oculus Rift, Microsoft Mixed Reality
Motion	LEAP Motion
Graphics	Nvidia GTX 1080/AMD Radeon RX Vega 64 and up

Summary

★★★★☆ **Features**
★★★★☆ **Performance**
★★★★☆ **Design**
★★★☆☆ **Value for money**

Verdict ★★★★☆

If you want to create more complex forms in VR Gravity Sketch is worth a serious look

Lenovo ThinkPad P1

Enough power for real 3D work in a slick, lightweight design

It's not often we cover two workstations from the same manufacturer in such a short space of time, as you might remember we already reviewed the Lenovo ThinkPad P52 in issue 122. But we think this update to the range warrants another piece of coverage.

That's because Lenovo has taken much of the same powerful workstation internals of the P52, which we found to be very well suited to 3D design, and (really this time) squeezed it down into an Ultrabook-like 15.6 inch form factor, weighing just 1.7kg and 18.4mm thick.

As far as mobile workstations go, the ThinkPad P1 might just take the award for the best-looking mobile workstation we've ever seen. The thin chassis works brilliantly with the matte black ThinkPad-style finish, making it look more like an executive folder than a laptop. And the inside looks and feels exactly like a ThinkPad too, with the same style of chiclet Lenovo keys, the buttons above the trackpad and the red mouse tracking button.

But, as with the P52, the immediate stand-out feature of the P1 is the intensely vivid 10-bit 4K touch-sensitive screen that supports 100 per cent of the AdobeRGB colour space. This is only an option, the entry-level P1 models use a non-touch 1080p display that lacks the vibrant colours and has lower brightness. The screen is a £200 upgrade that we'd absolutely recommend everyone choosing – even if you opt for the cheaper model. Our only disappointment with the display is that it doesn't run along the very bottom. There's a black section over an inch high that wastes some of this space.

The thin design is thanks to the choice of an Nvidia Max-Q Quadro P2000 4GB graphics card. This is one area that is a slight downgrade on the P52, which came with a beefier P3000. With a Max-Q variant of an Nvidia graphics card, you get the same features of the desktop variant, but at slightly lower clock speeds giving it a thermal envelope that requires less cooling and power consumption, and therefore better suited to thin laptops. It's probably not possible to really fit anything more demanding than a P2000 into a chassis this size, but we found the P2000 is still a capable card, well-suited to mid-range rendering work.

The rest of the internal specification is certainly worth talking about as well, as much of what made the P52 great has transitioned across to the P1. There's the option of Intel Core i7, Core i9 or Xeon processors, with four or six cores. You can squeeze in up to 64GB of memory and up to 4TB of storage spread between two M.2 slots. Unlike with Apple's comparable MacBook Pro design, Lenovo has been really generous with the ports as well. Two traditional USB Gen 1 ports are joined by two USB-C ports, HDMI, a 3.5mm headphone jack and an SD card reader. Ethernet is served by a mini port, which requires an adapter.

There's are a few welcome bonuses too. Firstly, although the P1 isn't described as rugged, Lenovo goes to some length to say it's at least durable thanks to a mag alloy construction material. We'd expect it to survive the odd small drop, something that can't be said of all laptops.

Then there's the nifty power supply, which is 35 per cent smaller than that of the P52, which is really brilliant news, considering that the brick-like power supplies with many laptops make the prospect of carrying your work around far less attractive.

Although the P1 is an expensive prospect, with pricing in line with other mobile workstations of comparable power, it's not the priciest laptop around. The entry level £1,549 system drops the P2000 to a P1000, has a quad core CPU and just 8GB of memory. Bump all the specs up and it crosses the £3,000 threshold.

It's this high-end configuration we tested, with a 2.7GHz six core Intel Xeon E-2167M processor, 32GB of memory and a Quadro P2000. We're pleased to say the P1 lives up to its potential.

Cinebench gave us an overall score of 1,121, which places the chip above any quad-core processor, but behind Ryzen and slightly slower than Intel's desktop Core i7 8700K. Without the same thermal and power constraints, desktop chips can run at faster clock speeds, which does slightly hurt the P1's performance by a small margin. In SpecViewPerf 13, we recorded scores that were about 50 per cent slower than the Quadro P3000 in Lenovo's bigger P52 laptop, as expected. But overall, the Quadro P2000 still performed admirably. OpenCL performance in Luxmark's Luxball test put in a score of 8,192, which is below desktop cards, but indicative of being useful in 3D tasks.

Crucially though, while this performance is not breaking any records, the size of the P1 is. Given the choice between a laptop that you can sling in a bag and still use for all your 3D tasks, or one that can output more frames per second but is going to severely weigh you down, we'd have to choose lighter and more portable every time.

Orestis Bastounis

> "The stand-out feature of the P1 is the intensely vivid 10-bit 4K touch-sensitive screen"

MAIN The display is absolutely gorgeous, with high colour accuracy that professionals need

BOTTOM LEFT The P1 delivers a no-compromise 3D design environment with a svelte look

BOTTOM MIDDLE It's refreshing to see a good selection of ports, even on a small laptop

BOTTOM RIGHT Keep your work safe with the integrated fingerprint scanner

BELOW Lenovo is trying to be seen as a real player in 3D systems, and the P1 is a great entry

Essential info

Price	£3,079
Website	lenovo.com
Processor	Intel Core i7, i9 or Xeon processor with four or six cores
Memory	8-64GB memory
Display	10-bit colour 4K display
Graphics card	Nvidia Quadro P2000 Max-Q graphics card

Summary

★★★★★ **Features**
★★★★☆ **Performance**
★★★★★ **Design**
★★★★☆ **Value for money**

Verdict ★★★★★

The P1 is a milestone in mobile workstation design. It's both highly portable and genuinely capable

Houdini 17

Daniel Bukovec, FX TD at Weta and Henry Dean, freelance rigging TD discuss the latest updates to SideFX's tool

When you do shot work in production, it is really important to be able to iterate as quickly as possible on an effect.

You want to quickly execute a complex fracture via optimised proxy geometries with the new convex decomposition, auto-generate constraints and throw that into a rigid body simulation, which then drives a pyro simulation. You want a fast turnaround.

Houdini 17 delivers on that with the new framework for material-based fracturing (built-in concrete, glass, wood material types), and a very fast pyro sourcing broken up into micro tools, which makes it easy to control with a vast array of tools already existing in the geometry context. It lets you concentrate more on the artistic side of things instead of fighting with technical difficulties; it's worth mentioning that there are no black boxes.

Vellum is a beast on its own. You will find this new framework really fun to play and work with. While only in its first iteration, it is already closing a lot of missing gaps to the software, like hair simulation, soft bodies and grains all working together. It's very easy to set up and can be used in both geometry and dynamics contexts.

The new, completely redesigned whitewater system will blow you away, too – it is a big step up from the previous iteration.

Small features, like easier creation of viewport visualisers, support for alembic layering, a new particle fluid node, the ability to retime geometry and volume caches, extracting transformations and centroids to name a few, come in really handy in everyday work. You will run into these little gems as you explore the new release.

Sure, people want everything at once, and no doubt I would be happy to see certain older parts of the software revamped, but developers listen and implement. This is a huge release, and indeed, certain parts are already revamped for the better.

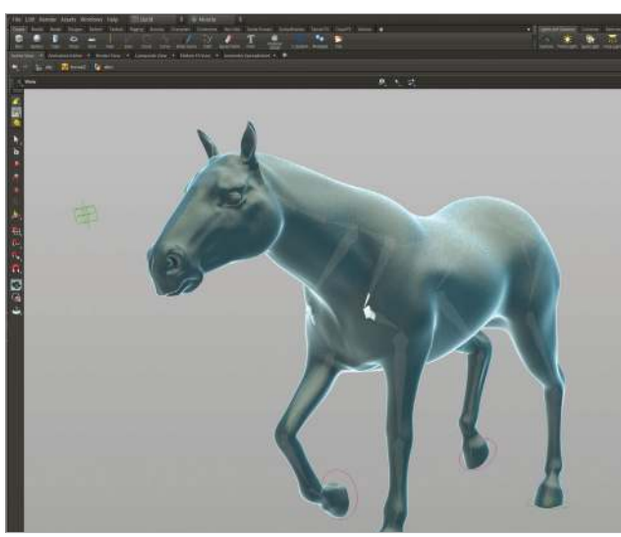
In terms of character rigging, there are some big, high-level tools new to Houdini 17 which will be, maybe conspicuously, absent in this review. These are the new Facial Autorig Module and the Pose Space Deformation tools. The first reason for this is there has simply not been enough time to develop a well-informed opinion as yet. The second is that, what is most exciting for riggers are the improvements to Houdini's heart and soul as a platform for tool building and problem solving. They are the low level building blocks that enable us to rapidly prototype, iterate and engineer solutions for any (un)imaginable task or problem. Fortunately Houdini 17 also has no shortage of these.

Houdini 17 is no exception, providing many long (and not so long) asked-for improvements for riggers and animators. Many of these lie in the area of UI and viewport interaction, with substantial changes to the playbar and improved channel management, a new Python viewport API, improved viewport interaction for bones and nulls, and transform handle updates amongst others. We've also now got an updated bone deformer, with a much cleaner UI, superior attribute handling/caching and much improved (in some cases vastly improved) performance! This comes alongside a completely reworked Blendshape node, which opens up many exciting new workflows. There is frankly too much to get through!

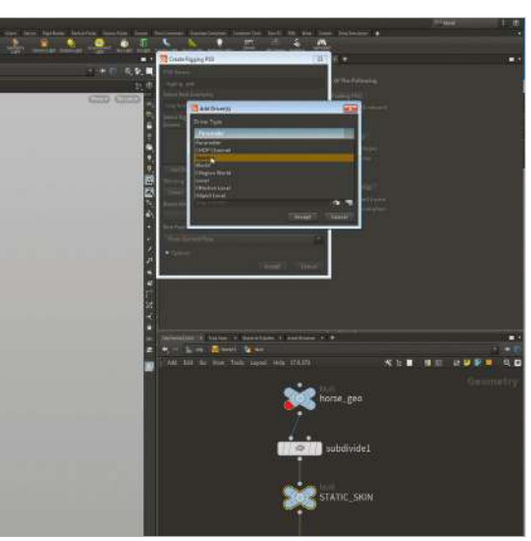
As a platform for character rigging and animation today, Houdini 17 is proving to be a massively powerful tool.

There are, of course, still things left to tend to – amongst the most crucial for character work: rig evaluation is still slower than it should be in many cases, and the animation UI could be improved further. Beyond these hurdles, there's a character-work paradise achingly close to hand in Houdini, and version 17 is definitely paving the way – so get stuck in! It's fun in here!

Daniel Bukovec and Henry Dean



> This comes alongside a completely reworked Blendshape node, which opens up many exciting new workflows



MAIN An example of Pose Space Deformation off (the left half) and on (the right half)

BOTTOM LEFT Vellum is an easy-to-set-up unified solver for cloth, hair, grains and soft bodies

BOTTOM MIDDLE The Pose Space Deformation toolset calls in blendshapes based on angle rotation (useful for character rigs, posing and shot finalising)

BELOW The RBD Material Fracture has inbuilt presets of concrete, glass and wood

Essential info

Price	Annual studio rental from $1,995 for Houdini Core / $4,495 for Houdini FX
Website	sidefx.com
OS	Windows 7 SP1 and up / Mac OS X 11.1 and up / Linux CentOS 7 and up
Memory	4GB minimum
CPU	Intel or AMD x64 CPU with SSE 4 minimum
Disk space	2GB

Summary

★★★★★ **Features**
★★★★☆ **Performance**
★★★★☆ **Design**
★★★★★ **Value for money**

Verdict ★★★★☆

Houdini 17 delivers an insane amount of features within a phenomenal package

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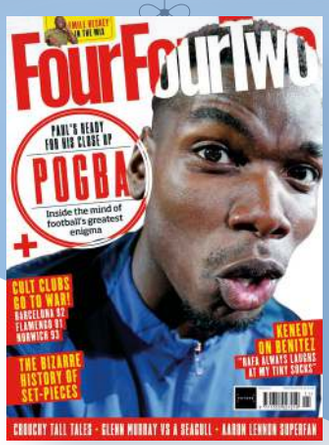

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Technique focus

Incredible 3D artists take us behind their artwork

CONCEPT I've always enjoyed adding mystery to nature, especially the 'why is this here?' question.

I find that in general it really doesn't take much. For this scene, the foliage was created using Megascans and SpeedTree 8 and I rendered the project in real-time in Unreal Engine 4.

Alexander Dracott
digitaldracott.com

Alex is a real-time lighting and VFX artist and VFX lead on the real-time experience team at Oculus. He enjoys creating artistic content.

Software Quixel Megascans, Unreal Engine 4, Photoshop, SpeedTree 8

Forest Lights, 2018

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The Hub

The inside guide to industry news, VFX studios, expert opinions and the 3D community

> “Right now it’s all about real-time pre-visualisation and being able to do live streaming of body and face animation”
>
> **Brian Mitchell,** managing director

3D print by Thomas Roussel displayed in the Gnomon gallery during the Summit

ZBrush Summit 2018 returns for its fifth successful year

James W Cain attended the ZBrush mecca in the heart of Hollywood, California

Having visited the ZBrush Summit for the first time last year I was really looking forward to attending this year. The summit brings together some of the best ZBrush artists in the world into the relatively snug location of the Gnomon School of Visual Effects, Games and Animation, Hollywood.

The summit traditionally starts with the sculpt-off, which pits 24 selected ZBrush artists against a three-hour time limit on a theme, streamed live with commentary from Joseph Drust and the wonderful Jessica Dru. I was in the hard surface category (well out of my comfort zone) and I can say that nothing quite beats the excitement of being in that room with some amazing artists all trying to beat the clock.

The entries are then put onto ZBrushCentral for a public vote, and the top three from each category win prizes with the first prize being the coveted ZBrush Champion Belt!

There have been a few criticisms of the sculpt-off, that it puts too much emphasis on speed and competition between the artists, I think these are valid concerns but the bottom line is most of us who have 'competed' really do feel a sense of fun about the event.

There was also the 'Michelangelo Challenge' where summit-goers had 15 minutes to sculpt a subject of their choosing from a cube. This was a really popular competition and there was no shortage of people willing to have a go (the prize being an Ultimaker printer).

The main feature of the summit is always the presentations, and this year there was an excellent line-up that packed out the main hangar of Gnomon. There were a few standout presentations for me this year, one of them was from Kris Costa, who showed an amazing breakdown on the work process for his photorealistic pieces. Insomniac Games also went into detail about the various ZBrush pipelines involved in creating their incredible *Spider-Man* game.

> "This was a really popular competition and there was no shortage of people willing to have a go"
>
> **James W Cain, digital sculptor**

Community favourite, Joe Menna took us on a journey through his process for making collectible figures, including how he cuts and keys his work using Live Booleans in ZBrush; really insightful for those looking to get into collectibles. I am constantly amazed at the standard and level of

Presentation by Blur with Krystal Sae Eua, Damien Canderle and Frankie DeRosa

ZBrush Image of the Year Award Winner – Kris Costa during his presentation

MC Louie Tucci with Madeleine Scott-Spencer and Lucas Cuenca from DNeg

Joseph Drust and Jessica Dru during the sculpt-off

Summit attendees ready for a drink!

professionalism displayed every year by each speaker and there's always something new to learn from people that are at the top of their ZBrush game. For students and those who wish to brush up on their skill sets, the workshops and portfolio reviews are a great way to access artists who could only ever be encountered online. The workshops are normally two-hour sessions on subjects such as character design and 3D printing, and appeal to a broad range of artists experienced and beginner alike.

Add to all of this the annual ZBrush awards, free prizes, live podcasts and this year's summit was in my opinion the best yet. Louie Tucci did a fantastic job as MC in what must be a difficult live environment, and the presentations were top notch. The whole event is also streamed live through social media, so even if you aren't there in person you can still catch up with the action. My only criticism of the event would be LA itself, which can be a bit daunting for unseasoned international travellers.

Saying this, I think the intimate location of the Gnomon school is perfect for the family atmosphere of the summit. It's a level playing field for both artists at the top and beginners alike to mingle and this for me is what makes it so special. Roll on next year!

A scene created using V-Ray Next for Maya

V-Ray Next for Maya launches

The next-gen rendering technology is now available with faster speeds and workflows

Chaos Group has released a new version of its Academy Award-winning renderer for Maya. It promises to bring the power of scene intelligence, faster production rendering, and streamlined Maya workflows to VFX and animation projects.

Vlado Koylazov, CTO and co-founder of Chaos Group says, "V-Ray Next is designed to support Maya artists at every level, providing faster workflows through a new set of features and optimisations. Now with better IPR and viewport rendering, artists can concentrate more on their creative ideas and the details that make their scenes and characters come alive." The overall rendering performance is on average 25 per cent faster than previous versions. Speed improvements are the result of scene intelligence, which analyses and optimises render calculations automatically with no added input.

An improved IPR that runs directly from the Maya viewport has also been introduced. It ensures faster interactive speeds and workflows. In addition to reducing time to first pixel, improved interactive rendering allows for continuous updates while editing or scrubbing through animations. There is also the addition of a production-ready GPU renderer. V-Ray GPU is twice as fast as the previous version with support for the fast rendering of volumetric effects such as smoke, fire and fog.

V-Ray Next for Maya is available now for Windows, Linux and Mac OS X. A full Workstation licence is priced at $1,040, with upgrades available for $420. There is also a subscription option, priced at $470 annually and $80 monthly. For more information visit chaosgroup.com/vray/maya.

Additional features

V-Ray Next for Maya will include a whole host of handy new features for artists. Physical Hair Material will produce realistic-looking hair with accurate highlights. There is also a new cel shader for non-photorealistic cartoon effects, as well as layered textures that use blend modes and individual masking controls.

Emmy awarded to cineSync

The interactive video review software wins award for outstanding technical achievement

Presented by the Academy of Television Arts & Sciences, Cospective received the award at the prestigious ceremony in Los Angeles on 24 October 2018. Other recipients at the awards ceremony include AVID and Lifetime Achievement winner Wendy Aylsworth.

Bob Munroe, VFX Supervisor of science fiction series *The Expanse* says, "More so than in the past, directors, producers, VFX supervisors, and editors are spread out across different locations. From previs to post on *The Expanse*, cineSync proved to be invaluable collaboration technology given the new normal of today's production workflow. I was thrilled to learn that the Television Academy is awarding an Engineering Emmy to cineSync. Remote video review has been key to expanding the visual effects industry as a whole."

Rory McGregor, CEO at Cospective adds, "We are thrilled to have been recognised by the Academy of Television Arts and Sciences for this prestigious award. We created cineSync with the goal of making global collaboration on complex creative projects accessible and simple for everyone involved in the process. We're proud to see all the incredible television projects being created today with the help of cineSync and will continue to develop our technology to support the industry for years to come."

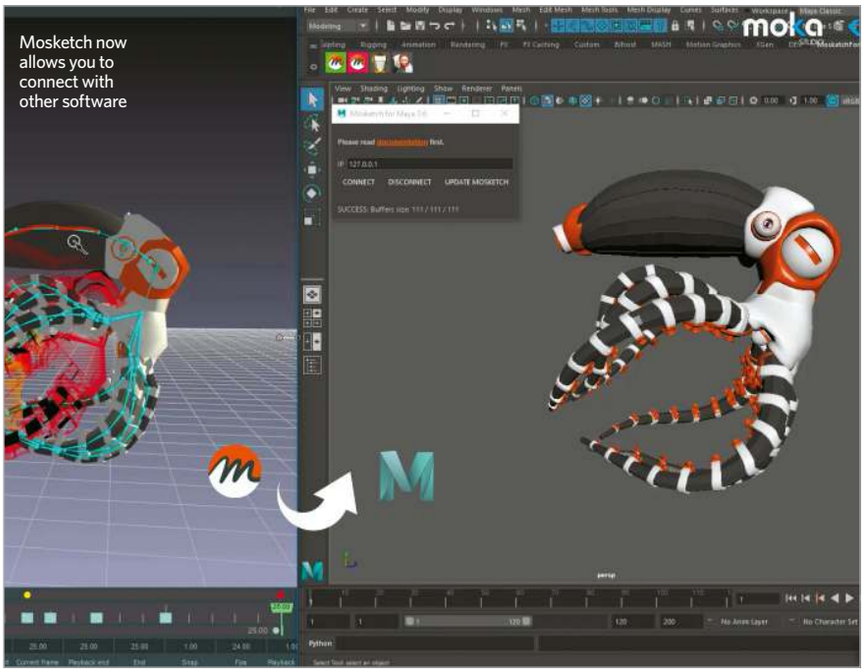
cineSync previously received an Academy Award for Technical Achievement in 2011

HAVE YOU HEARD? Postal has released a handmade animated film, The Nordy Club, a film for Nordstrom's rewards program

Mosketch gains integration with more software

Latest release includes a streaming server that allows users to connect with other 3D animation software

Artists can now download the latest release of Mosketch's early access. Version 0.17 includes a streaming server that allows users to connect with another 3D animation software. Benoît Le Callennec CEO of Moka Studio, the company behind Mosketch, says, "Professional animators go through months, even years, of training to eventually master one preferred 3D package. While we further develop and improve our software, we wanted to ensure that users could unlock the power of sketching poses in their current working environment." Mosketch 0.17 is available at **mokastudio.com/try-mosketch**.



Origami music video wins big

Music video featured in 3D Artist will receive Best In Show for the Computer Animation Program at SIGGRAPH Asia

Jean-Marie Marbach's video for *L'oiseau qui danse* by Canadian band Tennyson will be honoured with a Best In Show award for Siggraph Asia's Computer Animation Program. The video was created entirely with particles and Trapcode Suite. Marbach says, "It literally feels like something I could only dream of, then wake up and think 'damn, I dreamt I won Best In Show at SIGGRAPH Asia'. Hopefully I won't wake up until the ceremony in Tokyo."

Ludenso unveils MagiMask

Norwegian start-up's new AR headset and tracking system is aimed at developers and content creators

Norwegian technology start-up Ludenso (formerly MovieMask) has unveiled its augmented reality package for mobile devices, MagiMask, and its revolutionary tracking system. The project has been in development for the past two years. MagiMask is an affordable, easy-to-use head-mounted display that supports AR capable smartphones. Eirik Wahlstrøm, CEO and co-founder of Ludenso says, "Our HMD works with 99 per cent of existing apps without customisations, and gives 100 per cent augmented FOV and improved resolution."

It is now available to pre-order for $99.

The company has successfully developed and launched three versions of MovieMask prior to MagiMask

Software shorts

Bringing you the lowdown on product updates and launches

KeyShot 8

The latest update to the powerful 3D rendering software allows for real-time image adjustment. Users can also import their entire 3D model, no longer needing to cut it up beforehand. There are also improvements to liquids, which will no longer require separate surfaces. KeyShot 8 starts at $995 for the HD version, while KeyShot 8 Pro is $1,995. Visit **buy.keyshot.com** for more info.

VizMove VR 2.0

VizMove is a scalable, certified solution for enabling large-scale, location-based or remote VR experiences. The latest update includes a new development engine and further support for third-party software or hardware. There is also added support for the latest versions of Unity and Unreal. VizMove 2.0 is available now at the website **worldviz.com**.

Imverse LiveMaker

Imverse has announced the public beta release of Imverse LiveMaker. The VR modelling software allows users to transform any single 2D picture into a walkable and editable photorealistic 3D model. Photos can then be modified live from within the virtual space. Imverse LiveMaker can be downloaded from **imverse.ch/livemaker**, for a one-time fee of $29.

DID YOU KNOW? REWIND has debuted an AR experience that brings to life a limited edition Moncler Genius book

The official Vertex 2018 showreel can be found on **3D Artist**'s YouTube channel, or at **vertexconf.com**

Vertex will return bigger and better for 2019 event

The ultimate event for 2D and 3D artists will once again take over Olympia, London on 8 March to bring the community together with industry experts and much more

This year **3D Artist** teamed up with **3D World** and **ImagineFX** to host the first-ever Vertex event in March 2018, bringing the CG community together for an action-packed day of practical inspiration and networking opportunities. We are delighted to announce that we will be returning to the Olympia, London on Thursday 8 March 2019 for Vertex and it's going to be even bigger and better than ever before.

Vertex 2018 saw the likes of Scott Ross, Chris Nichols, Brett Ineson, Sébastien Deguy and many more share their industry wisdom with attendees.

Next year will see an equally impressive selection of experts descend on the Olympia to share hands-on advice, tips and talks. The expo floor will increase its size to accommodate even more stands from industry stalwarts, open to anyone with a free or AAA ticket.

A new area dedicated to 2D-themed talks will make its debut, as curated by **ImagineFX**, with key advice to help you take your work to the next level, regardless of your chosen medium. There will also be a devoted arch viz area in which the top agencies and artists will discuss how they construct the best architecture in the business, also revealing some of their cutting-edge techniques.

The main auditorium will once again host the day's keynote sessions, hosted by an array of leading creatives and industry veterans. They will provide unique insights into the tools of the future and dissect the very best in effects. Meanwhile a carefully curated selection of practical workshops and masterclasses will see CG artists teach the very latest skills.

Attendees will also be able to troubleshoot their technical and artistic woes one-on-one as Vertex's hugely popular 'Ask an Artist' area returns, with an exciting line-up of pros to be announced in the coming months.

> "The CG Awards are back and will celebrate achievements in the world of computer graphics, from the lone student artist, to the biggest Soho studios"

Our portfolio review sessions will be making a comeback, too. After this year's sessions sold out in half an hour, we're increasing the number of slots and making them longer, so that you can get all the advice you need to improve your employability. Whether you're taking your first steps into the industry or planning a career move, these sessions are not to be missed.

3D Artist is busy, along with **3D World** and **ImagineFX**, putting together a line-up of the industry's very best for our keynote talks

3D Artist editor Carrie Mok and **3D World** editor Rob Redman hosting this year's inaugural Vertex event

Vertex's expo floor exhibits true community spirit for both artists and attendees

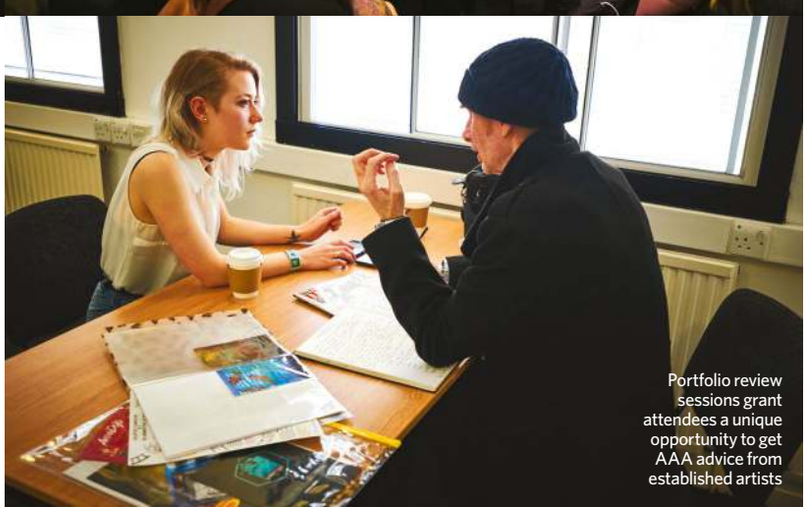
As if all that isn't enough, the CG Awards are back and the winners will be announced at Vertex 2019.

The awards will celebrate recent achievements in the world of computer graphics, from the lone student artist, to the biggest Soho studios.

The voting was open to the public, who decided two nominations per category to be given to an expert team of judges who will decide the ultimate winners. To find out more about our judges, go to **bit.ly/CGAwards2019Judges**.

So what are you waiting for? Ticket sales for Vertex 2019 are due to open very soon. AAA tickets will cost just £50, granting access to all the festivities and five rooms of talks.

There are also free tickets available for the expo floor and sponsored talks. Head to **vertexconf.com** to register your interest, you'll be notified when tickets go live and secure an early-bird discount.



Portfolio review sessions grant attendees a unique opportunity to get AAA advice from established artists

Job title Managing director

Location Oxford, UK

Website
audiomotion.com

Biography Brian has been with Audiomotion since day one and is now celebrating 21 years in the business. Amongst the projects he's been most proud to work on is *A Monster Calls*, on which he got to collaborate with film legend Liam Neeson on a motion capture shoot. When not hard at work Brian enjoys a spot of golf and heading to the coast with his family.

Portfolio highlights

- *Ready Player One, 2018*
- *Star Wars: The Last Jedi, 2017*
- *Horizon Zero Dawn, 2017*
- *A Monster Calls, 2016*
- *World War Z, 2013*
- *Harry Potter And The Deathly Hallows: Part 2, 2011*
- *The Golden Compass, 2007*
- *Gladiator, 2000*

Brian Mitchell

The managing director of Audiomotion celebrates 21 years of mocap at the company

Twenty-first birthdays are a milestone, they mark a coming of age and a transition into adulthood. For Audiomotion it sets it out as the elder statesman of the motion and performance capture industry, and managing director Brian Mitchell has been with the Oxford-based studio all the way. Across two decades it has become recognised for providing an unrivalled quality of full-body and facial capture, data solving, retargeting and other services.

Audiomotion is based in the sleepy town of Wheatley, just outside Oxford in the rolling English countryside, quaint surroundings for Europe's largest mocap stage. Their headquarters house a 20,000 square feet facility, equipped with 180 state-of-the-art Vicon cameras. It's the largest in-house capture area outside of North America.

So what is the secret of Audiomotion's success and longevity in an industry that rarely stands still? For Mitchell the answer is simple, "We've always produced high-quality character animation thanks to a combination of cutting-edge technology and a team of highly-skilled animators and technicians. Being able to draw on that team's vast experience and thorough understanding of their technology is a massive part of our success."

More impressive still is that Mitchell has been with Audiomotion the entire time, a rare occurrence in the industry. "We work on such a wide variety of projects across film, TV and games," he says, explaining what's kept him there for over two decades.

"A typical month for me might mean working on a dance project, followed by an action sequence for a game and then a TV commercial. It's this constant change that keeps things interesting. Every shoot poses new challenges and finding mocap-friendly solutions to problems is one of the best parts of the job."

Reflecting on the earliest days of Audiomotion, he continues, "Originally we just provided audio and motion capture to a small group of game developers." No prizes for guessing where they got their name.

Advancements in technology mean that Audiomotion has branched out a lot since the beginning.

"Over time there's been software and hardware developments that allow us to create much larger capture volumes, as well as record finger and facial animation," explains Mitchell. "Right now it's all about real-time pre-visualisation and being able to do live streaming of body and face animation. This allows the director to block out shots and make edits to their virtual camera angles as they film each scene."

Being at the cutting edge of motion and performance capture means that Mitchell and his team have been involved in a lot of big projects over the year.

Discussing a few of his personal highlights he says, "Movies like *World War Z* and *Ready Player One* are really exciting. Working with Liam Neeson on *A Monster Calls* was a fantastic experience and getting credits on *Star Wars: The Last Jedi* ticked a very large box for me."

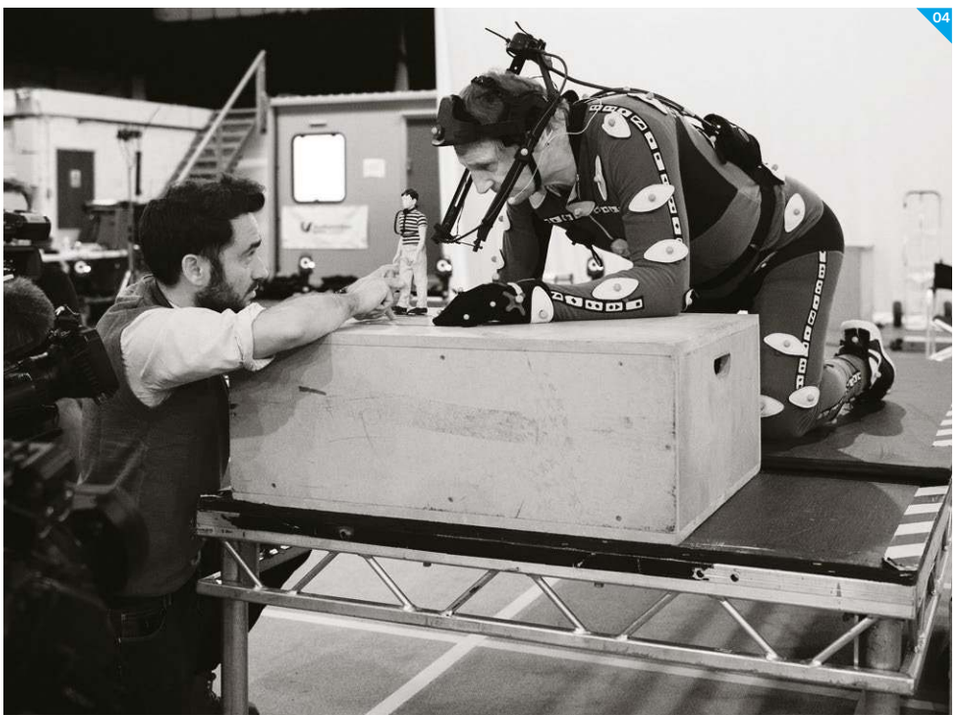
01

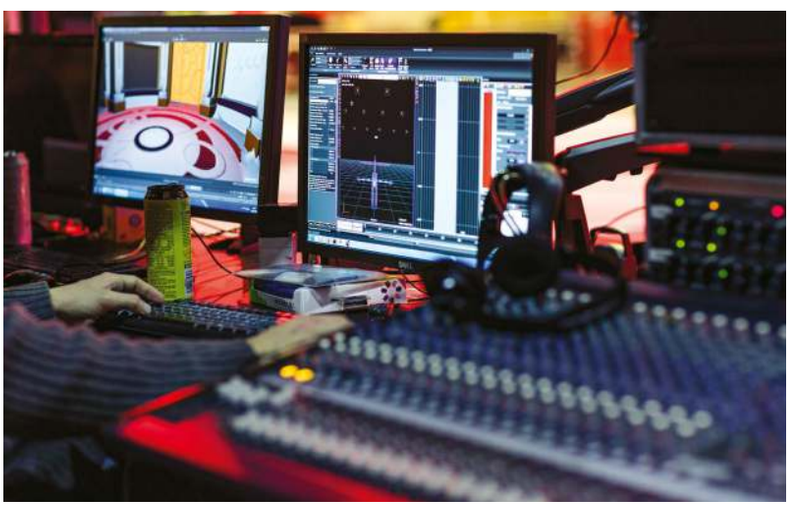
02

RECORD BREAKERS

How Audiomotion ended up with a Guinness World Record

"We're the Guinness World Record holders for the most people motion captured in real-time," says Brian Mitchell, "It was 19 hip hop dancers." The attempt took place on 9 March 2015, at Audiomotion's headquarters in Oxford, as two rival dance crews battled it out on the main stage. It was achieved with 36 F40 Vicon cameras, Blade software and Autodesk's MotionBuilder. The dancers were organised by National Lottery-funded project, the Hip Hop Heritage.



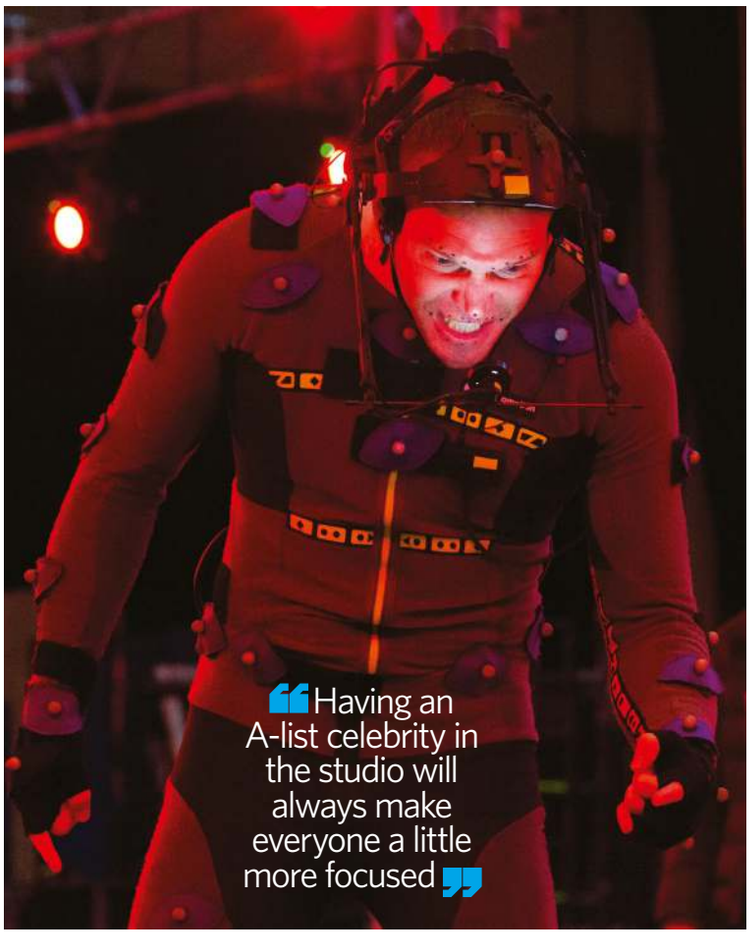


01 The company has also collaborated with well-known musicians such as the Black Eyed Peas and Take That

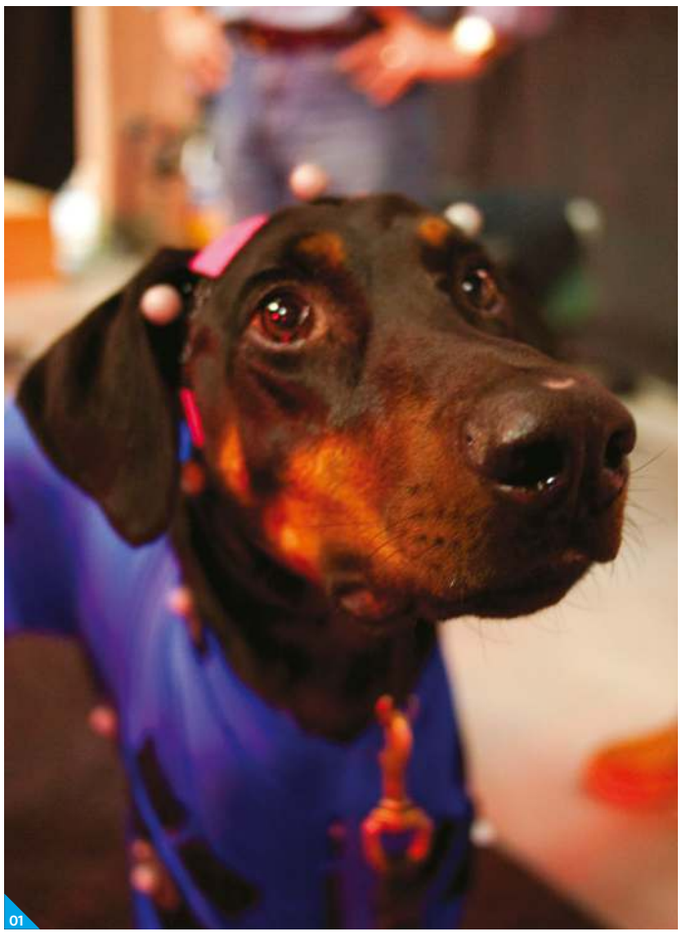
02 Eight horses, paired with chariots had to be captured for the studios work on Ridley Scott's *Exodus: Gods And King*

03 Audimotion also offers full performance casting services, with the variety of skilled and experienced actors, dancers and stuntpeople they've worked with previously

04 Director J A Bayona and Liam Neeson shooting *A Monster Calls*. Bayona was able to conceptualise shots in the 3D scene via a virtual camera



> Having an A-list celebrity in the studio will always make everyone a little more focused



01 Audiomotion has mocapped both cats and dogs in the past, Mitchell insists that dogs were much easier to control

02 Amongst the capture services offered by Audiomotion are: real-time visualisation, full body, finger, facial and prop capture, as well as on-location work

03 The team worked with storyboards, artwork, 3D models and previs to help create the monster's scenes in *A Monster Calls*

04 Audiomotion was involved in the entire mocap pipeline on Steven Spielberg's *Ready Player One*

It isn't all giant Hollywood movies though, "We've worked on many AAA video games in the last two decades and I feel it's a testament to our capabilities that we have had so many returning clients," adds Mitchell.

Those AAA titles include the likes of *Far Cry 3*, *Alien: Isolation* and *Horizon Zero Dawn*.

Constantly pushing the boundaries of their technology has created some challenges along the way for Audiomotion. "Working with children and animals always creates a few extra challenges," admits Mitchell. Then there's the small matter of having genuine Hollywood legends in your midst, just as Liam Neeson was when the studio worked on his motion capture performance for *A Monster Calls*. "Having an A-list celebrity in the studio will always make everyone a little more focused," he adds.

> "A typical month for me might mean working on a dance project, followed by an action sequence for a game, and then a TV commercial"

"Large scale location shoots also bring their own set of issues to overcome," he continues.

"Motion capture on ice was a particularly good one and introducing a football alongside a dozen exuberant players will always raise the blood pressure too."

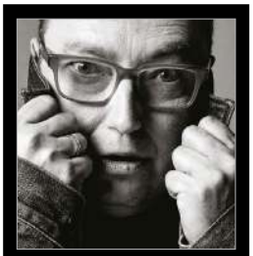
So with such an impressive portfolio under its belt and a wide variety of experiences, what could the next 21 years hold for Audiomotion? "Motion capture has many applications in virtual, augmented and mixed reality," explains Mitchell. "This brings us some exciting new opportunities to work with these emerging technologies. Streaming real-time animation into game engines makes virtual production a reality, and production companies are always challenging us to push the boundaries technologically. Whether that means capturing real-time faces or live-action and animation simultaneously."

Whatever the next two decades hold for motion capture you can rest assured that Brian Mitchell and Audiomotion will continue leading the charge.

MOTION LIBRARY

Audiomotion recently announced that developers will have access to its library of assets via Unity's Asset Store

The partnership with Rokoko's Motion Library will be hosted on Unity Technologies' own Asset Store. A select amount of Audiomotion's data will be available for developers to prototype and download, all within Unity's real-time 3D development platform. New sets of data for the community are to be released over the coming months. "We hope this partnership will enable us to engage with a wide cross-section of the creative industries," says Brian Mitchell. Rokoko will launch The Motion Library for developers on other platforms at **motionlibrary.com**.



Website
unity.com

Location USA

Project *Baymax Dreams*

Project description This new series of shorts based on *Big Hero 6: The Series* was made with the Unity game engine.

Studio Unity

Company bio Unity is behind the widely used real-time game engine now used in many areas spanning 2D, 3D, VR and AR experiences and virtual production. In recent times, the real-time aspects of the engine have been utilised to provide animation/VFX houses with a new approach to production.

Contributors

- Simon J Smith, director

Baymax Dreams

Director Simon J Smith shares the secrets of real-time directing

A veteran of traditional CG animated features, director Simon J Smith helmed *Bee Movie*, *Penguins Of Madagascar* and *Shrek 4D* at PDI/DreamWorks. On those kinds of films, the animation and review process could be laborious, with changes often taking days or weeks. However, it was a vastly different experience on the real-time rendered *Baymax Dreams*.

For the series of short films, made by Unity and Disney Television Animation, the director was able to make changes to high-quality renders on the fly. "I had to leave all my baggage from 20 years at DreamWorks first," he says. "But I was quite happy to do that because this was a fresh project, and it took me way back to when I got excited about CG in the first place."

Smith oversaw a relatively fast asset creation and animation process – done using Maya and other CG tools – that quickly went into the Unity game engine. Here, the final aspects of the episodes were produced, including layout, lighting, effects, rendering and compositing.

The shorts, between two and three minutes each, tell the story of the *Big Hero 6* robot Baymax dreaming of electric sheep, battling bedbugs and even making duplicates of himself. And although the shorts are based on an existing IP, the team did not use any of Disney's existing assets – they started from scratch, another thing only made possible by using Unity, says Smith.

"We made a conscious choice and Disney made a conscious choice not to give us any assets at the beginning. So what you saw was ten people in six months going from nothing to making broadcast TV quality work."

In the game engine, Smith could adjust things in a much more timely way than in a traditional pipeline. One aspect of Unity the director particular liked was adjusting cameras, "There'd be times where we'd be working on a shot and I would have this idea to change something and we'd plug it in and then, boom, there's the shot. I would say, 'It's absolutely perfect – don't touch it! Just save!' I mean, changes like that normally take forever to do."

One of the challenges Smith did experience was that the toolset in Unity is still going through an evolution in terms of having components that are 'filmmaker-friendly'. That means that some descriptions of things that can be done in the engine, such as camera movement, had particular descriptions from the gaming world.

"Once you start going on one of these kinds of projects, the ambition extrapolates very quickly," says Smith. "But Unity are keeping up with all the creative ideas. They were amazing. The stories are going to push the technology."

"I really love being at the forefront of what's going to happen next," adds Smith. "I feel very lucky and blessed to be involved in *Baymax Dreams* because this is definitely going to change the game for some people. I can tell better stories and have been able to get closer to the characters earlier. That to me is really important."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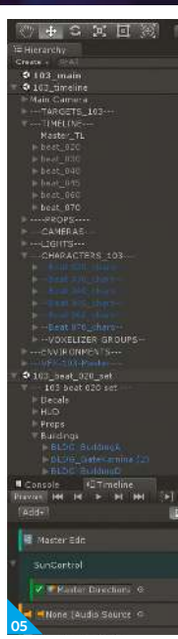
TOOLS IN THE TOOLBOX

The tools in Unity that made Baymax Dreams possible include Timeline and Cinemachine

Unity's multi-track sequencer called Timeline essentially allows a user to bring in and create animation clips and recorded animation. It's here that you can create cinematic content, cutscenes, gameplay sequences, edit audio and create more complex effects.

The 'smart' camera tool is called Cinemachine, which lets you set up and manipulate cameras inside Unity – essentially a way of framing shots and crafting a cinematic side to your project.

Other tools inside Unity, such as the High-Definition Render Pipeline (HDRP), helped achieve Baymax's emissive 'night-light' glow, while effects such as voxelisation were also crafted in-engine.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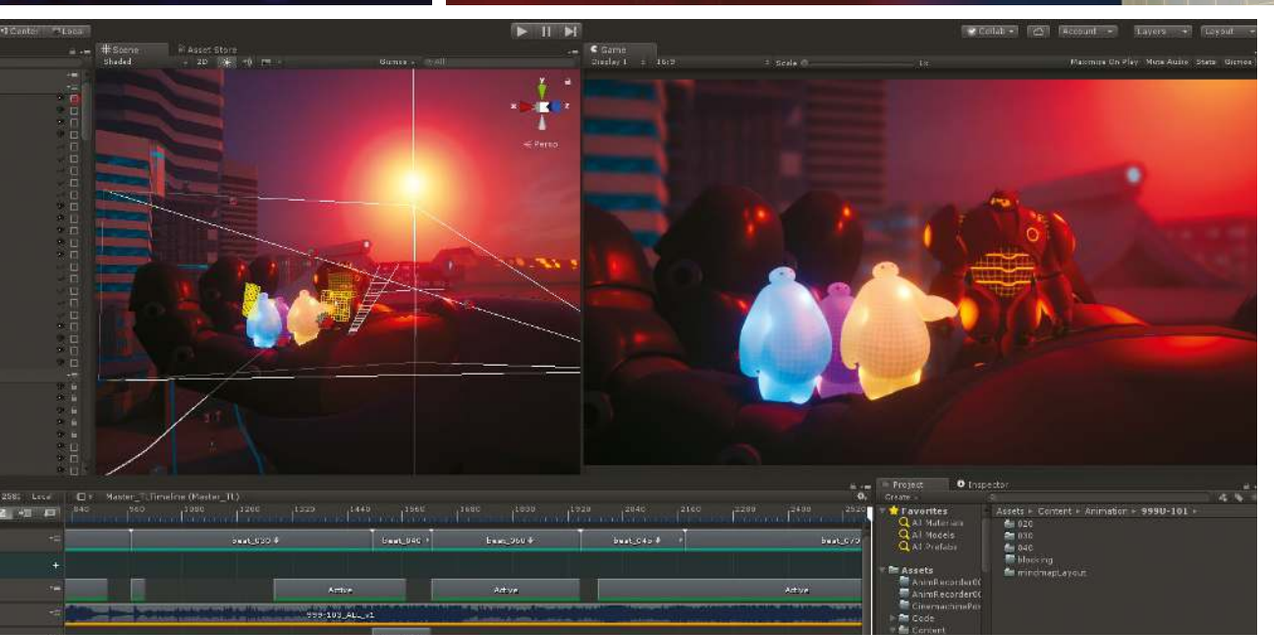
> We made a conscious choice and Disney made a conscious choice not to give us any assets at the beginning



01 *Baymax Dreams* is a new Disney Television Animation series of shorts made with the Unity game engine

02 A huge draw to the series for Simon J Smith was the use of the real-time engine to quickly mock-up and iterate scenes, and be able to adjust cameras and lighting almost instantly

03 The shorts tell the adventures of *Big Hero 6* robot Baymax

04 *Baymax Dreams* is available on the DisneyNOW and Disney Channel YouTube channels

05 The Unity user interface for *Baymax Dreams*. Timeline and Cinemachine were key components used in the making of the shorts

Job title President and CTO, at Animatrik Film Design

Location Vancouver (main headquarters) and Los Angeles (secondary facilities)

Website animatrik.com/services/facilities

Biography Brett Ineson is CTO of Animatrik Film Design and president of the largest independent motion capture studio in North America. He will frequently head up shoots for Hollywood's biggest blockbusters, as well as the most successful gaming franchises of the 21st century. Brett sits on the board of the Motion Capture Society and has worked in technology development with industry leaders Vicon, Lightstorm Entertainment and Autodesk.

Portfolio highlights

- *Avengers: Infinity War, 2018*
- *Deadpool 2, 2018*
- *Ready Player One, 2018*
- *Pacific Rim: Uprising, 2018*
- *Justice League, 2017*
- *Kong: Skull Island, 2017*
- *ADAM The Mirror, 2017*
- *Carne y Arena, 2017*
- *Gears Of War 4, 2016*
- *Warcraft, 2016*

Brett Ineson

The Animatrik founder and motion capture legend on early days of the studio and more

With a love for animation, cameras and technology since he was young, it could be said that the marriage of the two in the form of performance capture is absolutely perfect for Animatrik's president and CTO Brett Ineson. Starting his career as a keyframe animator, Ineson eventually worked his way up to become technical director at Sony. At the time, Ineson was working on children's television and when it was decided that more motion capture would be incorporated into the show, Ineson worked on adding it into the series.

It was here that his love for performance capture grew, "I started to pursue different gigs in motion capture camera manufacturers. I'd go back into production and work on a film or game, and I'd work for companies that make software for motion capture and I'd go back and work on films and games. After a while I decided it was time to start my own stage and do it for myself."

That would ultimately lead to Ineson founding Animatrik in 2001 in Vancouver, Canada. Animatrik provides stage and location-based performance capture as well as virtual camera services. It currently has the largest independent soundstage in North America, and it's something that grew over time as Ineson explains, "You know, when we started out our stage was quite small. We had a volume that was 30 x 40m. In doing this work, you always want a bigger place to work because you're just bouncing into the walls.

"I would start to rent soundstages, I'd leave my small stage, move onto a soundstage for a couple of days and move back in. I was doing that a bit too often, so finally I just had to find a soundstage for myself and see if I can lease it, and that's what we did.

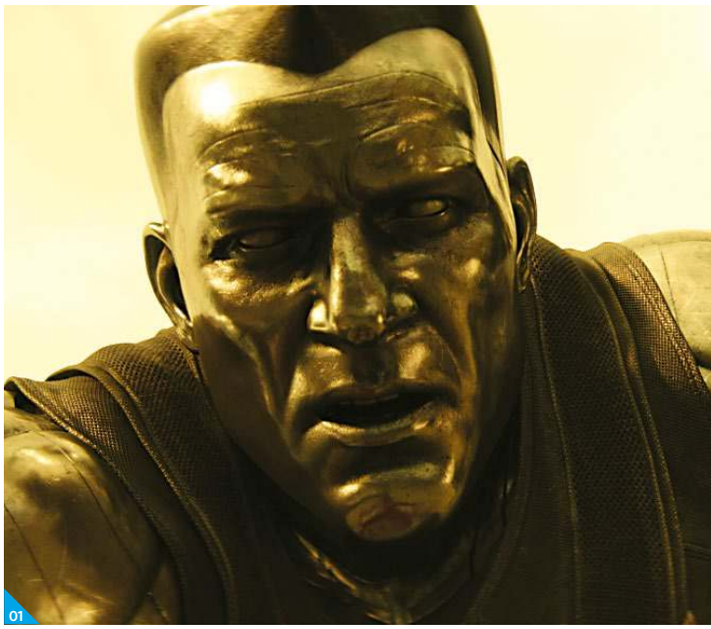
"It was probably a bit premature, as we didn't have the work to fill it but we thought 'Let's take a risk!'"

Outside of the main services that Animatrik provides, Ineson explains that there's a bit more to having great performance capture than just having a good suit, the latest technology, a brilliant support team and a large soundstage, "There's one thing I always like to talk about, and that's the importance in understanding the relationship between the actor and the character.

"You can't just put anyone in a mocap suit and expect them to play that character and it to look good in film – that's an art form in itself. To a large extent, that's outside of what we do – so that's the relationship between the actor, director and movement coach. We're there to support that. On films that already understand that very well, they hire a movement coach.

"There's one we work with a lot called Terry Notary. He'll take an actor, and he'll understand how our technology works, and he'll ask us to tune parameters on how we're interpreting this actor's performance. At the same time, he's working with the actor, saying 'this is how this character needs to feel, how their weight affects [everything], how you need to walk'.

"When all that comes together, that's the performance. There's so much in it that people don't see."



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FILM FAVOURITES

Ineson tells of two Animatrik projects that stand out the most to him

Of the many films, TV and games in Animatrik's portfolio, Ineson points out two that he feels the most affinity, "I still feel *District 9* is my favourite, and it's probably because that one was the first film we worked on. I didn't have any employees at that time, so I contracted a couple of people to help me but I did most of the work by my own, so I'm quite proud of that one. The second one is probably *Warcraft*, that's the biggest virtual production that I think has ever been done. It was really a big undertaking that I haven't seen in any other film before, so to work on that was really exciting."

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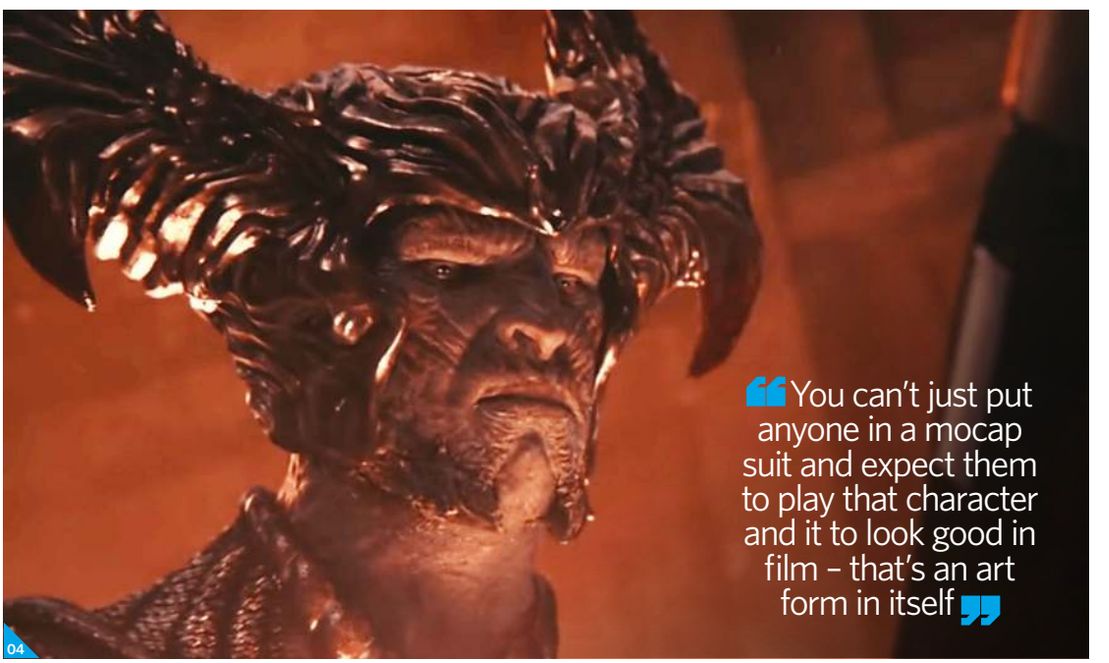

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01 For *Deadpool 2*, Animatrik tracked the actor for Colossus and compensated for difference in scale between a human and the giant character

02 Chris Harvey, VFX supervisor at Oats (the creators of *Adam*), had previously worked with Animatrik on *Chappie* and *Zero Dark Thirty*

03 Ineson worked on the first ever 3D animated TV series, *Reboot*, in 1994

04 Animatrik built a specialist stage at Universal for the motion capture of *Justice League* villain Steppenwolf as well as additional shots

05 The studio also provided mocap work featured in *Gears Of War 4*

06 Ineson cites *Warcraft* as one of his favourite films to work on

GAVAN GRAVESEN
CEO & Co-founder, RADiCAL
getrad.co

How AI accelerates human motion for the independent 3D content pipeline

RADiCAL's Gavan Gravesen on how artificial intelligence will empower creators

The indie scene, for both film and games, is booming. In historical terms, we see vastly more high-quality indie content. Yet, I believe that we have to do much better in supporting the independent 3D artist with newer, more affordable and universally available tools. We owe it the future of the 3D industry to give that support. And I don't mean that in an esoteric, romanticised, way.

It was no accident when Apple recently announced that, "[We] want all kinds of creatives to be able to create content [for AR]". This statement lays bare that Apple, like many others, has come to recognise a profound truth: compelling content is vital in making the 3D industry fulfil its potential across film, gaming and XR apps.

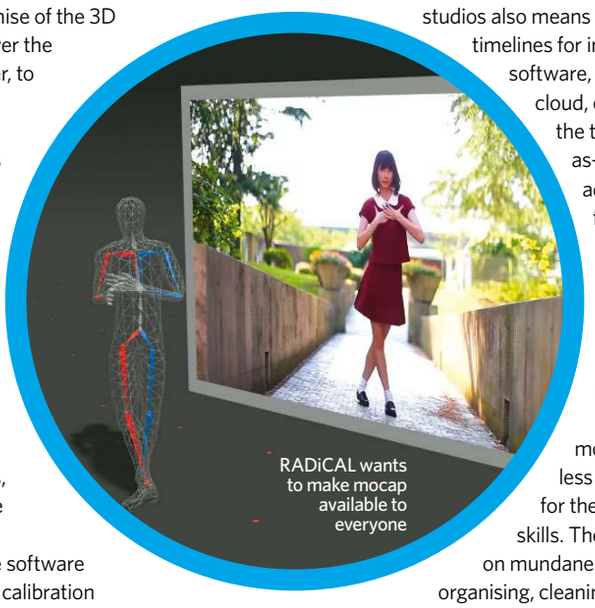
So to deliver on the promise of the 3D industry, it needs to empower the independent artist. However, to many of us, the greatest roadblock to reaching the industry's full potential is its own technology pipeline, with its disparate tools, engines and hardware.

I co-founded RADiCAL because we believe that artificial intelligence can help level the playing field for indies. RADiCAL makes 3D motion capture available to everyone – we don't require awkward suits, expensive cameras, irritable sensors, markers, studios, extensive planning, massive software downloads or never-ending calibration sequences. Of course, RADiCAL is not alone in using AI to help transform the 3D content industry. Take Ubisoft's new tools to automatically clean up motion capture data. Some, such as our partners at Nvidia, are training AI to help virtual characters navigate virtual spaces. Facebook is pushing projects such as DeepPose and our friends at DeepMotion are using reinforcement learning and articulated physics to teach virtual characters high-level motion skills.

There's a reason for the focus on motion. Animating humanoid motion is difficult to get right. While motion capture can accelerate the animation process, the studio, equipment, software and labour all add up too quickly for independent creators.

However, like software before it, I believe that AI can accelerate at least part of the pipeline considerably.

More specifically, it will do that in at least four ways. Let's look at these one by one.



RADiCAL wants to make mocap available to everyone

First, AI can now dramatically reduce the need for specialised, expensive and awkward hardware in 3D motion capture. Historically, either optical sensors or inertial trackers have been used to place the body in 3D space. But both hardware options are expensive to acquire and maintain, sensitive to the environment you're in and, like any physical tools, deteriorate with time. RADiCAL's technology is an example of how AI replaces such hardware with ordinary consumer devices. Moreover, the cost of distributing or executing lines of code pales in comparison to moving physical hardware itself. If something breaks, a solution is just a patch away.

Second, independence from hardware and constrained studios also means that there is more flexible timelines for indies. With AI-powered software, delivered through the cloud, creators can work with the technology on an as-needed basis. As an added benefit, that flexibility and accessibility is mirrored in the provider's distribution model: RADiCAL's software has dramatically faster time-to-market pathways.

Third, software-only motion capture requires far less admin by those you hired for their design and animation skills. They will spend far less time on mundane tasks such as planning, organising, cleaning up and rigging. And for those that don't have traditional human animation skills to begin with, even those making their first Unity game in a college dorm, they can now add the motion they capture themselves to their development cycle.

Fourth, Amazon Sumerian, MagicLeap and Facebook AR Studio are just a few examples of platforms that are hoping to shorten the 3D pipelines considerably. With some luck, in a few years, you won't have to maintain a library of licences for disparate programs that barely integrate. RADiCAL is working on a future in which you can bake your motion to your character in the cloud, without having to resort to external software packages.

I can't wait to see more AI-powered software, and more seamless integration, to help accelerate 3D content generation for everyone.

If we make that happen, then I am even more confident that the independent artist will become an essential force in delivering on the promise of the 3D industry.

Technique focus

Incredible 3D artists take us behind their artwork

MODELLING

First, I started with a DynaMesh mesh, and the next step was to start the guidelines with Dam_Standard, making pieces separately. I then made a brush and added the tentacles and started to put up the divisions and added more cool details. I had to make sure every piece was good on this model because it was going to be printed in metal.

Julio C B Macias
juliocesarbenavidesmacias.artstation.com

Julio is a 3D artist of collectibles with nearly two years in the 3D world, he lives in Mexico.

Software ZBrush

Iron Spider, 2018

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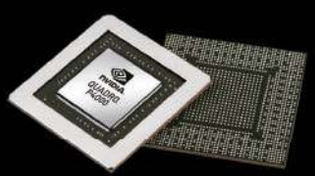

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